

**From:** [Cassida, Jim](#)  
**To:** [Stratton, Robert D](#)  
**Cc:** [Beyer, Jim R](#); [shawn.b.mahaney@usace.army.mil](mailto:shawn.b.mahaney@usace.army.mil); [Mark McCollough](#); [Mahaney, Wende](#); [Todd Presson](#); [jkennedy@jaycashman.com](mailto:jkennedy@jaycashman.com); [Parker Hadlock](#); [Lauren Walsh](#); [Hengstenberg, Derek](#); [Lin, Mao](#); [Perry, John](#); [Todd, Charlie](#); [Settele, Rebecca](#); [Boyd, Sarah](#); [Thorndike, Elizabeth](#)  
**Subject:** RE: Moscow Renewable Energy Project  
**Date:** Tuesday, May 19, 2020 1:20:35 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[Moscow Figure 2.pdf](#)

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Bob:

Please find attached an updated figure that depicts the natural resource study area for the Moscow Renewable Energy Project layout. Since we last spoke the Project has been evolving and is now considering going with a smaller turbine size to better leverage the available wind resource at the Project site. The smaller turbine capacity requires the addition of nine additional turbines to the west of the original layout to maintain the same overall Project capacity. We are in the process of amending our wildlife study plan to account for the additional footprint. Staff may be reaching out for feedback over the next week or so to assist in this process.

Regards,

Jim

**James Cassida** | Senior Program Director – Energy & Natural Resources  
Direct: 207.358.2389 | Office: 207.358.2400 | Cell: 207.650.6406 | [jim.cassida@tetrattech.com](mailto:jim.cassida@tetrattech.com)

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**From:** Stratton, Robert D <Robert.D.Stratton@maine.gov>  
**Sent:** Tuesday, March 10, 2020 8:54 AM  
**To:** Cassida, Jim <Jim.Cassida@tetrattech.com>  
**Cc:** Beyer, Jim R <Jim.R.Beyer@maine.gov>; [shawn.b.mahaney@usace.army.mil](mailto:shawn.b.mahaney@usace.army.mil); [Mark McCollough <Mark\\_McCollough@fws.gov>](mailto:Mark_McCollough@fws.gov); [Mahaney, Wende <wende\\_mahaney@fws.gov>](mailto:wende_mahaney@fws.gov); [Todd Presson <TPresson@jaycashman.com>](mailto:TPresson@jaycashman.com); [jkennedy@jaycashman.com](mailto:jkennedy@jaycashman.com); [Parker Hadlock <PHADLOCK@cianbro.com>](mailto:Parker_Hadlock@cianbro.com); [Lauren Walsh <LLOHN@cianbro.com>](mailto:LLOHN@cianbro.com); [Hengstenberg, Derek](#)

<Derek.Hengstenberg@tetrattech.com>; Lin, Mao <Mao.Lin@tetrattech.com>; Perry, John <John.Perry@maine.gov>; Todd, Charlie <Charlie.Todd@maine.gov>; Settele, Rebecca <Rebecca.Settele@maine.gov>; Boyden, Sarah <Sarah.Boyden@maine.gov>; Thorndike, Elizabeth <Elizabeth.Thorndike@maine.gov>

**Subject:** Moscow Renewable Energy Project

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Good morning Jim,

Per your request, please find attached, MDIFW's recommendations related to resource surveys for the proposed Moscow Renewable Energy Project, as well as copies of current Department guidance documents referenced within. If you have any questions, please feel free to contact me. Thank you, Bob.

**Bob Stratton**

**Wildlife Biologist**

**Environmental Program Manager**

Maine Department of Inland Fisheries & Wildlife

284 State Street; 41 State House Station

Augusta, Maine 04333-0041

Tel: (207) 287-5659

[mefishwildlife.com](http://mefishwildlife.com)

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**Cc:** [Beyer, Jim R](#); [shawn.b.mahaney@usace.army.mil](mailto:shawn.b.mahaney@usace.army.mil); [Mahaney, Wende](#); [Todd Presson](#); [jkennedy@jaycashman.com](mailto:jkennedy@jaycashman.com); [Parker Hadlock](#); [Lauren Walsh](#); [Hengstenberg, Derek](#); [Lin, Mao](#); [Perry, John](#); [Todd, Charlie](#); [Settele, Rebecca](#); [Boyden, Sarah](#); [Lin, Mao](#); [Thorndike, Elizabeth](#)  
**Subject:** RE: Moscow Renewable Energy Project  
**Date:** Monday, June 22, 2020 1:59:39 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[Patriot\\_Moscow\\_StudyPlan\\_2020-06\\_18\\_Final.pdf](#)

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Please find attached the Moscow Renewable Energy Project Wildlife Study Plan for your review and comment. This plan has been developed in consideration of all comments previously received during our phone and email consultations.

Regards,

Jim

**James Cassida** | Senior Program Director – Energy & Natural Resources

Direct: 207.358.2389 | Office: 207.358.2400 | Cell: 207.650.6406 | [jim.cassida@tetrattech.com](mailto:jim.cassida@tetrattech.com)

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**To:** [Lin, Mao](#)  
**Cc:** [Cassida, Jim](#); [Hengstenberg, Derek](#); [Beyer, Jim R](#); [Zeh, Sally](#); [Puryear, Kristen](#)  
**Subject:** RESPONSE: Moscow Renewable Energy Significant Botanical Resources Information Request  
**Date:** Monday, July 27, 2020 1:40:39 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[tetrattech\\_moscow\\_renewableenergy.pdf](#)  
[tetrattech\\_moscow\\_renewableenergy\\_DACF\\_Solar\\_Soils\\_Letter.pdf](#)  
[tetrattech\\_moscow\\_renewableenergy\\_PUCclearance.pdf](#)

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Hi Mao,

Attached are MNAP's comments, MNAP's PUC determination, and DACF soil comments for the solar/wind project in Moscow. Thank you,

### Lisa St. Hilaire

Information Manager | Maine Natural Areas Program  
Department of Agriculture, Conservation and Forestry  
177 State House Station | Augusta, ME 04333 (**NEW** mailing address)  
90 Blossom Lane | Augusta, ME 04333 (**NEW** physical address)  
**PHONE 207-287-8044** (Same phone!)  
FAX 287-7548 (**NEW** FAX)

---

**From:** Lin, Mao <Mao.Lin@tetrattech.com>  
**Sent:** Thursday, July 16, 2020 2:22 PM  
**To:** NAP, Maine <Maine.NAP@maine.gov>  
**Cc:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Subject:** Significant Botanical Resources Information Request

**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 Maine Natural Areas Program,

On behalf of Patriot Renewables, LLC and Cianbro Corporation (the Applicant), this letter is to request any information the Maine Natural Areas Program may have on rare and unique botanical features including the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities in or around the proposed Moscow Renewable Energy Project (the Project) which includes the decommissioned United States Air Force Radar Installation in the towns of Moscow and Caratunk, Somerset County, Maine. To aid in the review, a figure and associated zipped shapefile of the Project area are attached. Tetra Tech is supporting the Applicant with evaluating this site for a proposed wind and solar generation facility.

Please review the project area and identify any known or suspected locations of rare and unique botanical features within the outlined area associated with this proposed development. If you have



any questions or require additional information regarding this request please contact me directly at (917) 687-5838 or email me at [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com).

Thank you for your time and attention.

- Mao Lin

**Mao Lin** | Wildlife Biologist

Direct (207) 358-2384 | Main (207) 358-2400 | Fax (207) 879-9481 | E-mail: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

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DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY

177 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

July 20, 2020

Mao Lin  
Tetra Tech  
451 Presumpscot St.  
Portland, ME 04103

Via email: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

**RE: Proposed Moscow Renewable Energy Project, Proposed Wind and Solar Generation Facility, Moscow and Caratunk; Threatened, and Endangered Plants and Rare or Exemplary Natural Community Clearance Determination**

Dear Mr. Lin:

I am writing in response to your request for a determination from the Maine Natural Areas Program (MNAP) on the potential for the above referenced project to result in adverse impacts to rare, threatened, or endangered plants or rare and exemplary natural communities, pursuant to the Maine Public Utilities Commission's Distributed Generation Siting Attribute criteria number 5.

There is no comprehensive statewide inventory that includes all rare, threatened, or endangered species occurrences and natural community types. Though many resources are included on data layers and resource maps, the completeness of these varies by species, habitat type, location, and previous survey efforts. Thus, such tools should be considered preliminary unless otherwise indicated by MNAP. It is the applicant's ultimate responsibility to ensure that their actions do not result in adverse impacts to rare, threatened, or endangered plants and rare or exemplary natural communities, regardless of whether species occurrences or natural communities have been previously identified and mapped.

MNAP's determination for this proposed project site is indicated in the selection below:

- Based on review of the information provided, current documentation and available information indicate no known adverse impacts rare, threatened, or endangered plants or rare or exemplary natural communities on the proposed project site or in the vicinity.**
- Based on review of the information provided, current documentation and available information indicate no known adverse impacts to rare, threatened, or endangered plants or rare or exemplary natural communities on the proposed project site. However, rare, threatened, or endangered plants or rare or exemplary natural communities have been documented in the vicinity of the proposed project site and MNAP recommends further investigations and surveys to enable a more definitive determination. Please contact MNAP for further guidance and survey protocols.**

MOLLY DOCHERTY, DIRECTOR  
MAINE NATURAL AREAS PROGRAM  
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- Based on review of the information provided, current documentation and available information indicate the presence of rare, threatened, or endangered plants or rare or exemplary natural communities on the proposed project site. Please refer to the response from MNAP regarding three rare plant species along the right-of-way which was included in the project footprint.**

Please note that this determination relates only to known information on rare, threatened, or endangered plants or rare or exemplary natural communities in relation to the proposed project site. This determination does not constitute a full environmental review response for the proposed project. If you require additional information, please contact [maine.nap@maine.gov](mailto:maine.nap@maine.gov).

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program  
207-287-8043 | [kristen.puryear@maine.gov](mailto:kristen.puryear@maine.gov)

Cc: Sally Zeh, Christine Cook (MPUC)  
Jim Beyer (MDEP)



**STATE OF MAINE**  
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 COMMISSIONER

July 20, 2020

Mao Lin  
 Tetra Tech  
 451 Presumpscot St.  
 Portland, ME 04103

Via email: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

Re: Rare and exemplary botanical features in proximity to: Moscow Renewable Energy Project, Proposed Wind and Solar Generation Facility, Moscow and Caratunk, Maine

Dear Mr. Lin:

I have searched the Maine Natural Areas Program’s Biological and Conservation Data System files in response to your request received July 16, 2020, with updated mapping for the project received January 30, 2020 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Moscow and Caratunk, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, the powerline right-of-way intersects with three rare plant species. Please see the table below and attached map and factsheets for more information about these species. If there is to be any additional clearing or new infrastructure associated with the right-of-way, MNAP requests a more detailed site plan and a site visit so that we may better comment on how the proposed activities may affect these rare plants at this location.

Feature	State Status	State Rank	Global Rank	Occurrence Rank	Site
Red-stemmed Gentian <i>Gentiana rubricaulis</i>	T	S1	G4?	B Good	ROW South of Beaudoin Road, Moscow
Goldie’s Wood Fern <i>Dryopteris goldiana</i>	SC	S2	G4G4	CD Fair-Poor	ROW South of Deadwater Radar Station
Clinton’s Bulrush <i>Tricophorum clintonii</i>	SC	S3	G4	C Fair	ROW near Chase Stream, Moscow

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include

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information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$225.00 for three hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program  
207-287-8043 | [kristen.puryear@maine.gov](mailto:kristen.puryear@maine.gov)



# Moscow Renewable Energy Project Moscow & Caratunk, Maine



Rare Plant



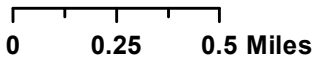
Rare/Exemplary Natural Community



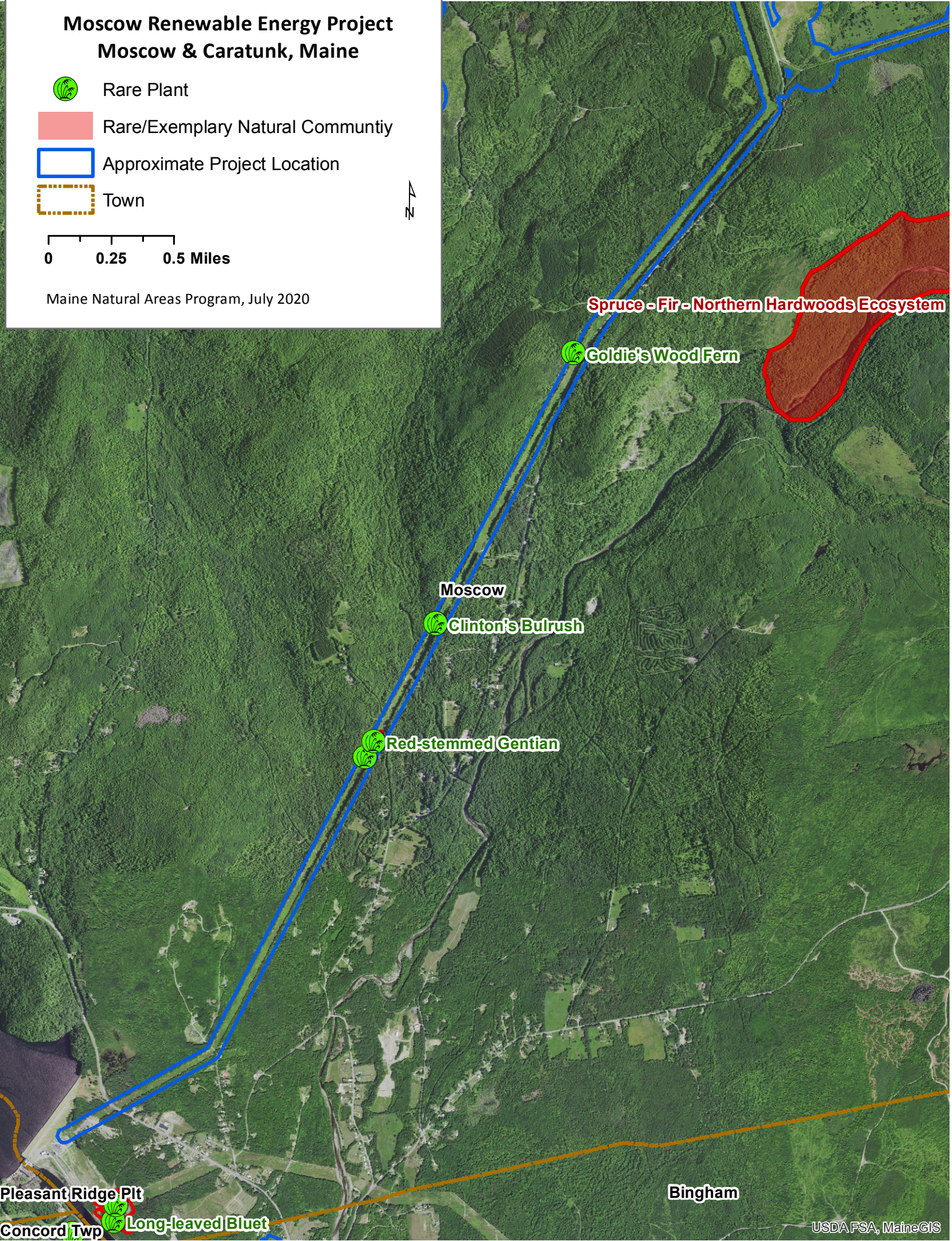
Approximate Project Location



Town



Maine Natural Areas Program, July 2020



Spruce - Fir - Northern Hardwoods Ecosystem

Goldie's Wood Fern

Moscow

Clinton's Bulrush

Red-stemmed Gentian

Pleasant Ridge Plt

Concord Twp

Long-leaved Bluet

Bingham



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## Maine Natural Areas Program

### *Dryopteris goldiana* (Hook. ex Goldie) Gray

#### Goldie's Wood Fern

- [State Rank](#): S2
- [Global Rank](#): G4
- [State Status](#): Special Concern

**Habitat:** Rich mostly calcareous woods. [Hardwood to mixed forest (forest, upland)]

**Range:** Southeastern Canada to the Carolinas; Tennessee, Iowa, and Minnesota.

**Aids to Identification:** Goldie's wood-fern has a short, creeping rhizome and large, deep green leaves in a crown-like cluster 1-1.5 m high. The twice-divided leaves are about 3/4 broad as long at the base, tapering quickly to a point. The stalk is covered with distinct shiny brown scales about 2.5 cm long.



**Ecological characteristics:** Known in Maine from rich hardwood forests.

**Phenology:** Sori apparent in July - August, fronds evergreen.

**Family:** Polypodiaceae

**Synonyms:** *Aspidium goldianum* Hook. ex Goldie.

**Known Distribution in Maine:** This rare plant has been documented from a total of 26 town(s) in the following county(ies): Aroostook, Franklin, Kennebec, Oxford, Penobscot, Piscataquis, Somerset.

**Reason(s) for rarity:** Habitat naturally scarce.

**Conservation considerations:** Effects of logging are not well known; partial removal of the canopy would be less likely to adversely affect the plant than would complete canopy removal.



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18 Elkins Lane  
Augusta, ME 04333  
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Fax: (207) 287-2400  
TTY Users Call Maine Relay  
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[DACF@Maine.gov](mailto:DACF@Maine.gov)



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## Maine Natural Areas Program

### *Gentiana rubricaulis* Schwein.

#### Red-stemmed Gentian

- [State Rank](#): S1
- [Global Rank](#): G4?
- [State Status](#): Threatened

**Habitat:** Moist woods, wet meadows, and shores, especially nongranitic substrates.



**Family:** Gentianaceae

**Synonyms:** *Dasystephana grayi* (Kusnez.) Britt; *Gentiana linearis* Froel. ssp. *rubricaulis* (Schwein.) J. Gillet; *Gentiana linearis* Froel. var. *lanceolata* Gray; *Gentiana linearis* Froel. var. *latifolia* Gray.

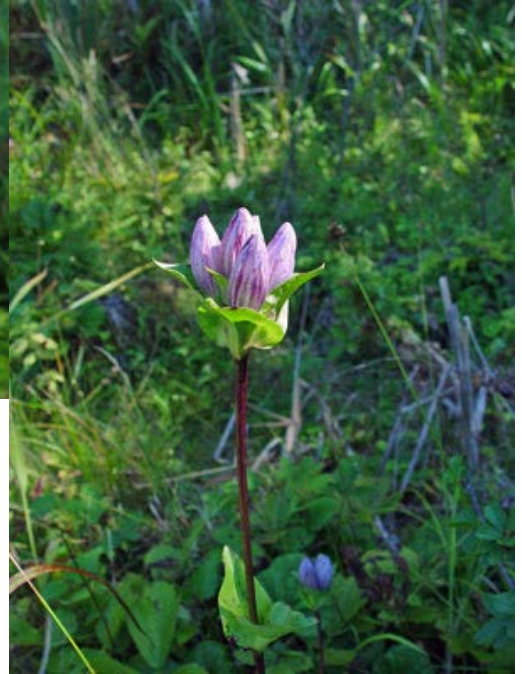


**Range:** Isolated stations in Maine and New Brunswick; otherwise Ontario to Saskatchewan, Minnesota, Wisconsin, Michigan, and Nebraska.

**Phenology:** Flowers August to September.



**Known Distribution in Maine:** This rare plant has been documented from a total of 6 town(s) in the following county(ies): Kennebec, Somerset.



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[DACE@Maine.gov](mailto:DACE@Maine.gov)



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## Maine Natural Areas Program

### *Trichophorum clintonii* (Gray) S.G. Smith

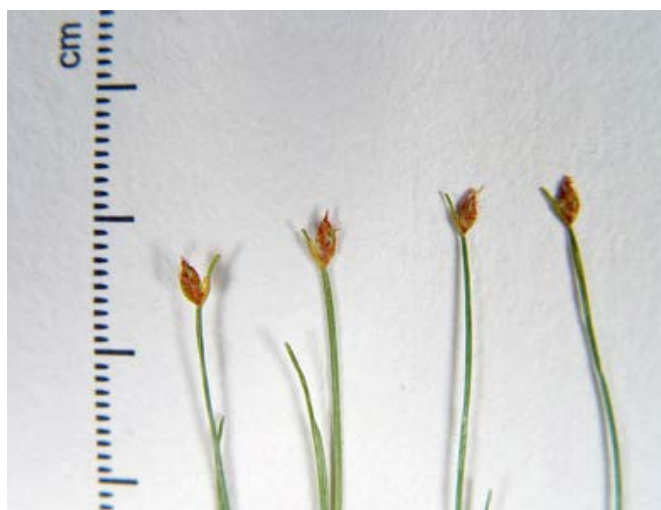
#### Clinton's Bulrush

- [State Rank](#): S3
- [Global Rank](#): G4
- [State Status](#): Special Concern

**Habitat:** Dry or springy argillaceous or slaty ledges, gravel or open woods and turfy shores. [Open wetland, not coastal nor rivershore (non-forested, wetland); Non-tidal rivershore (non-forested, seasonally wet)]

**Range:** Quebec and New Brunswick to New York and Minnesota .

**Aids to Identification:** Members of the genus *Trichophorum* are sedges with solitary, terminal spikelets subtended by an enlarged scale. The achenes, which lack tubercles possessed by spikerushes, are subtended by 3-6, brown or white, perianth bristles. This short bulrush characteristically grows in dense, low tufts. The lower sheaths are bladeless, the upper bearing leaves shorter than the stem. The terminal spikelet is 4-5 mm wide and has 4-7 flowers. The achenes (fruits) are pale brown, 3-angled, and 1.4-2 mm wide. The triangular stem (in cross section) separates this from the very similar *T. cespitosum*, which has a round stem. Also closely related to *T. alpinum*, it can be distinguished by its brown bristles about 2 mm long.



**Ecological characteristics:** This species has been found in Maine growing on calcareous, ledgy shores.

**Phenology:** Perennial. Fruits May - July.

**Family:** Cyperaceae

**Synonyms:** *Baeothryon cespitosum* (L.) A. Dietr.; *Scirpus clintonii* Gray.

**Known Distribution in Maine:** This rare plant has been documented from a total of 23 town(s) in the following county(ies): Aroostook, Kennebec, Penobscot, Piscataquis, Somerset.

**Reason(s) for rarity:** At southern limit of range.

**Conservation considerations:** Known populations are small, but not currently subject to any particular human threat; it seems to persist on the few river ledges where it grows. Heavy recreational use of ledges could pose problems.

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Rare and Exemplary Botanical Features within 4 miles of  
 Project: Moscow Renewable Energy Project, Decommissioned Air Force Radar Installation,  
 Moscow and Caratunk, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Bulrush Sedge						
	SC	S2	G5	2001-08-31	7	Rocky summits and outcrops (non-forested, upland), Non-tidal rivershore (non-forested, seasonally wet)
Circumneutral Outcrop						
	<null>	S2	GNR	2001-08-31	9	Rocky summits and outcrops (non-forested, upland)
Clinton's Bulrush						
	SC	S3	G4	2001-08-31	23	Open wetland, not coastal nor rivershore (non-forested, wetland), Non-tidal rivershore (non-forested, seasonally wet)
	SC	S3	G4	2018-07-12	36	Open wetland, not coastal nor rivershore (non-forested, wetland), Non-tidal rivershore (non-forested, seasonally wet)
Goldie's Wood Fern						
	SC	S2	G4G5	2018-07-12	31	Hardwood to mixed forest (forest, upland)
Hemlock Forest						
	<null>	S4	G4G5	2001-08-22	20	Conifer forest (forest, upland), Hardwood to mixed forest (forest, upland)
Hyssop-leaved Fleabane						
	SC	S2	G5	1906-07	16	Non-tidal rivershore (non-forested, seasonally wet), Rocky summits and outcrops (non-forested, upland)
Long-leaved Bluet						
	SC	S2S3	G5TNR	1906-07-03	8	Non-tidal rivershore (non-forested, seasonally wet)
	SC	S2S3	G5TNR	2018-06-06	17	Non-tidal rivershore (non-forested, seasonally wet)
New England Violet						
	SC	S2	G4	1925-07-07	14	Non-tidal rivershore (non-forested, seasonally wet)
Red-stemmed Gentian						
	T	S1	G4?	1902-08-29	2	Open wetland, not coastal nor rivershore (non-forested, wetland), Old field/roadside (non-forested, wetland or upland)
	T	S1	G4?	2018-07-06	6	Open wetland, not coastal nor rivershore (non-forested, wetland), Old field/roadside (non-forested, wetland or upland)

Rare and Exemplary Botanical Features within 4 miles of  
 Project: Moscow Renewable Energy Project, Decommissioned Air Force Radar Installation,  
 Moscow and Caratunk, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Richardson's Tansy-mustard	T	S1	G4?	2018-07-11	8	Open wetland, not coastal nor rivershore (non-forested, wetland), Old field/roadside (non-forested, wetland or upland)
Showy Orchis	PE	SH	G5T5	1934-08-21	2	Rocky summits and outcrops (non-forested, upland)
Spruce - Fir - Northern Hardwoods Ecosystem	E	S1	G5	1907-06-13	17	Hardwood to mixed forest (forest, upland)
Sycamore	<null>	S5	GNR	2013-11-01	9	Conifer forest (forest, upland), Hardwood to mixed forest (forest, upland)
Upper Floodplain Hardwood Forest	PE	SX	G5	1948-07-13	1	Forested wetland, Hardwood to mixed forest (forest, upland)
White Cedar Woodland	<null>	S3	GNR	2015-09-10	36	Forested wetland
	<null>	S2	GNR	2001-08-31	3	Conifer forest (forest, upland), Dry barrens (partly forested, upland)

## STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.
- SU** Under consideration for assigning rarity status; more information needed on threats or distribution.
- SNR** Not yet ranked.
- SNA** Rank not applicable.
- S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

**Note:** **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

## GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.
- GNR** Not yet ranked.

**Note:** **Global Ranks** are determined by NatureServe.

## STATE LEGAL STATUS

**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered and Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

## NON-LEGAL STATUS

- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

## ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

**Note:** **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!  
<http://www.maine.gov/dacf/mnap>

**From:** [John Tipping](#)  
**To:** [Lin, Mao](#)  
**Subject:** Fwd: Epeorus  
**Date:** Tuesday, October 27, 2020 11:06:26 AM

**CAUTION:** This email originated from an external sender. Verify the source before opening links or attachments.

Hi Mao, I just received this from Beth.

----- Forwarded message -----

**From:** Swartz, Beth <[Beth.Swartz@maine.gov](mailto:Beth.Swartz@maine.gov)>  
**Date:** Tue, Oct 27, 2020 at 10:59 AM  
**Subject:** RE: Epeorus  
**To:** John Tipping <[loticmaine@gmail.com](mailto:loticmaine@gmail.com)>  
**Cc:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>

John,

Sorry to take so long getting back to you – my email has been overwhelming lately. I did hear back from Steve. He felt that based on your description of the *Epeorus* sp nymphs you collected that they would be too immature to be *E. frisoni*. I think he said likely *E. pleuralis* but difficult to ID to species regardless, being so immature. Given that, MDIFW is comfortable concluding that *E. frisoni* was not found during the surveys of Mink, Chase and Bassett brooks. There is no need to send the specimens to Steve for identification and there are no further concerns for the Roaring Brook Mayfly in regards to this project. Thank you also for sending the earlier report.

beth

---

**Beth I. Swartz, Wildlife Biologist**

Reptile, Amphibian and Invertebrate Group

Maine Department of Inland Fisheries and Wildlife

650 State Street, Bangor, ME 04401

(207) 941-4476

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*Information that you wish to keep confidential should not be included in email correspondence.*

---

**From:** John Tipping <[loticmaine@gmail.com](mailto:loticmaine@gmail.com)>  
**Sent:** Tuesday, October 27, 2020 10:04 AM  
**To:** Swartz, Beth <[Beth.Swartz@maine.gov](mailto:Beth.Swartz@maine.gov)>  
**Subject:** Re: Epeorus

**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.**

Hi Beth,

I was wondering if you had heard from Steve. Tetra Tech would like to get this portion of the report finalized.

Thanks!

John

---

Virus-free. [www.avg.com](http://www.avg.com)

On Tue, Oct 13, 2020 at 11:49 AM Swartz, Beth <[Beth.Swartz@maine.gov](mailto:Beth.Swartz@maine.gov)> wrote:

Thanks John. Let me check with Steve to see if he thinks it could be at all informative to look at the *Epeorus – E. frisoni* nymphs should be mature at this stage, and early instars are difficult to ID. I'll get back to you as soon as I hear back from him.

beth

---

**Beth I. Swartz, Wildlife Biologist**

Reptile, Amphibian and Invertebrate Group

Maine Department of Inland Fisheries and Wildlife

650 State Street, Bangor, ME 04401

(207) 941-4476

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*Information that you wish to keep confidential should not be included in email correspondence.*

---

**From:** John Tipping <[loticmaine@gmail.com](mailto:loticmaine@gmail.com)>

**Sent:** Tuesday, October 13, 2020 11:09 AM

**To:** Swartz, Beth <[Beth.Swartz@maine.gov](mailto:Beth.Swartz@maine.gov)>

**Subject:** Epeorus

**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.**

Hi Beth,

I recently conducted a survey for *Epeorus frisoni* in Mink Brook, Chase Stream and Bassett Brook in Bingham. This was for the Patriot Renewables Development, for which Tetra Tech is handling most of the permitting. We found 5 *Epeorus* nymphs in Chase Stream, but they were all early instars, so we couldn't identify to species. Mao Lin at Tetra Tech would like me to send the specimens to you to be forwarded to Steve Burian. If you are working in the office in Bangor, I might just drop them off if that is ok.

We collected representative specimens of all of the taxa we found, I attached the list. The richness was fairly high given the dry conditions.

Thanks,

John Tipping

Lotic Inc.

**From:** Wittig, Thomas <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>

**Sent:** Tuesday, December 17, 2019 9:12 AM

**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>

**Subject:** Re: [EXTERNAL] Moscow Renewable Energy Project, Maine- Eagle Surveys

**⚠ CAUTION:** This email originated from an external sender. Verify the source before opening links or attachments. ⚠

Hello Derek,

Thanks for reaching out, and for putting this information together.

Here are the Eagle Rule's standards for pre-construction surveys:

*(ii) Applications for eagle incidental take permits for wind facilities must include pre-construction eagle survey information collected according to the following standards, unless exceptional circumstances apply and survey requirements can be modified to accommodate those circumstances after consultation with, and written concurrence by, the Service:*

*(A) Surveys must consist of point-based recordings of bald eagle and golden eagle flight activity (minutes of flight) within a three-dimensional cylindrical plot (the sample plot). The radius of the sample plot is 2,625 feet (ft) (800 meters (m)), and the height above ground level must be either 656 ft (200 m) or 82 ft (25 m) above the maximum blade reach, whichever is greater.*

*(B) The duration of the survey for each visit to each sample plot must be at least 1 hour.*

*(C) Sampling must include at least 12 hours per sample plot per year for 2 or more years. Each sample plot must be sampled at least once per month, and the survey start time for a sampling period must be selected randomly from daylight hours,<sup>1</sup> unless the conditions in paragraph (d)(3)(ii)(F) of this section apply.*

<sup>1</sup>*Daylight hours are defined as the hours between sunrise and sunset.*

*(D) Sampling design must be spatially representative of the project footprint,<sup>2</sup> and spatial coverage of sample plots must include at least 30 percent of the project footprint. Sample plot locations must be determined randomly, unless the conditions in paragraph (d)(3)(ii)(F) of this section apply.*

<sup>2</sup>*The project footprint is the minimum-convex polygon that encompasses the wind-project area inclusive of the hazardous area around all turbines and any associated utility infrastructure, roads, etc.*

*(E) The permit application package must contain the following:*

*(1) Coordinates of each sample point in decimal degrees (specify projection/datum).*

*(2) The radius and height of each sample plot.*

*(3) The proportion of each three-dimensional sample plot that was observable from the sample point for each survey.*

*(4) Dates, times, and weather conditions for each survey, to include the time surveys at each sample point began and ended.*

*(5) Information for each survey on the number of eagles by species observed (both in flight and perched), and the amount of flight time (minutes) that each was in the sample plot area.*

*(6) The number of proposed turbines and their specifications, including brand/model, rotor diameter, hub height, and maximum blade reach (height), or the range of possible options.*

*(7) Coordinates of the proposed turbine locations in decimal degrees (specify projection/datum), including any alternate sites.*

*(F) Stratified-random sampling (a sample design that accounts for variation in eagle abundance by, for example, habitat, time of day, season) will often provide more robust, efficient sampling. Random sampling with respect to time of day, month, or project footprint can be waived if stratification is determined to be a preferable sampling strategy after consultation and approval in advance with the Service.*

You can find the full standards under this section of the [electronic Code of Federal Regulations](#).

In my experience, projects are most often tripped up by the 30% area coverage and random placement of points. If there is still uncertainty about where turbines will be placed, I recommend aiming for slightly higher coverage (e.g. 35-40%) so that the project is less likely to fall below the 30% threshold if subsequent footprint revisions put more survey area out of bounds. Also note that the definition of project footprint is slightly than what may have been previously used. I believe the Eagle Conservation Plan Guidance may have advised calculating a 1km buffer around turbines; the Eagle Rule instead uses a minimum convex polygon.

In addition to random sampling, the Eagle Rule also leaves room for stratified random sampling, provided there is consultation with and approval from the Service prior to implementation. I recognize that there are often many constraints that make purely random sampling impractical. I'm more than happy to discuss alternative ideas, but I'd recommend these discussions happen prior to survey, not after; the Eagle Rule is fairly unforgiving on this matter and doesn't provide much allowance for post-hoc approvals.

I've also attached the Service's data reporting template. This template is mostly intended for data submission from applicants, but I believe looking at it can help inform survey design.

Please let me know if you questions on any of this information.

Best,  
Tom

On Thu, Dec 12, 2019 at 5:21 PM Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)> wrote:

Hello Thomas-

Thanks for taking the time to chat with me about eagles and the Moscow Wind/Solar Project. We just had a project scoping meeting earlier this week with the USACE, MEDEP, MDIFW, and a follow up call with Mark McCollough to discuss the latest version of the project and field survey recommendations. The project develop found a suitable interconnection to the grid (which stopped the project last time) and are looking to conduct field surveys in 2020 plan to file permit late 2020/early 2021. As I mentioned we conducted a variety of wildlife surveys in 2012/2013 including eagle nest survey, raptor/eagle surveys in spring, summer, and fall. Surveys were designed with input from USFWS and MDIFW and following guidelines at that time.

Going forward we are trying to leverage some of the historical data and supplement where relevant. We are proposing to kick off eagle use surveys this January to get this project updated with some new data and look forward to your recommendations.

I have attached project description, site map, and our wildlife survey report from our initial survey work.

Let me know if you have any questions and look forward to your feedback.

Thanks

**Derek Hengstenberg, CWB®** | Project Manager/ Wildlife Biologist  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**Tom Wittig**  
Eagle Coordinator, Div. of Migratory Birds  
USFWS, North Atlantic-Appalachian Region  
300 Westgate Center Drive  
Hadley, MA 01035  
(413)253-8577 phone  
(413)253-8424 fax

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**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Tuesday, March 10, 2020 9:43 AM  
**To:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>; Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>;  
McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Cc:** Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>  
**Subject:** FW: Moscow Renewable Energy Project

Hello Mark, Wende, Tom -

Well- it certainly felt like spring yesterday with temps in the 60's in Portland. We received MDIFW recommendations on what additional natural resource surveys are needed at the Moscow Renewable Energy Project this year. We have already begun to implement weekly golden eagle surveys into our regime which also helps fulfill the monthly eagle use survey component that we was started this earlier this winter (no eagles to report yet). So we will have a lot more survey effort in addition to the ongoing eagle use surveys. We are using the same two points from the eagle use surveys for these additional golden eagle surveys.

MDIFW has requested a great blue heron aerial rookery survey within a 4 mile radius of the site (May 1 to June 15) and has differed the need for Eagle Nest Surveys to the USFWS. So I think we will be flying for the great blue heron survey this spring to satisfy that condition and adding in eagle survey into survey would be doable but timing might be off a bit.



Let me know if we need to set up a call to chat. We could also discuss anything else related to this project. As Mark knows already, we have picked up lynx on the game cameras.

Thanks

Derek

---

**From:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Sent:** Tuesday, March 10, 2020 10:19 AM  
**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>; Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Cc:** Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>  
**Subject:** Re: Moscow Renewable Energy Project

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Thanks Derek. It looks like it will be an early spring and eagles may nest early. You will probably want to fly eagle nests in early- to mid-April? You can always swing by eagle nests on the great blue heron flight later to check on status. We saw the MDIFW recommendations this morning. Thanks for keeping us informed of your camera survey results for lynx.

Mark

Mark McCollough, Ph.D.

Endangered Species Biologist  
Maine Field Office, U. S. Fish and Wildlife Service  
306 Hatchery Way  
East Orland, Maine 04431  
Office phone: 207 902-1570  
Cell phone: 207 944-5709



*Wildlife and its habitat cannot speak, so we must and we will... Teddy Roosevelt*  
*Climb the mountains and get their good tidings... John Muir*

---

**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Wednesday, March 11, 2020 11:27 AM  
**To:** Wittig, Thomas W <thomas\_wittig@fws.gov>; McCollough, Mark <mark\_mccollough@fws.gov>  
**Cc:** Lin, Mao <Mao.Lin@tetrattech.com>; Mahaney, Wende <wende\_mahaney@fws.gov>  
**Subject:** RE: Moscow Renewable Energy Project

Thanks Tom and Mark for the feedback- This helps with planning.

If I understand correct our approach to fly the 4 mile radius for the great-blue heron survey and then get a status update on the eagle nests along the Kennebec River that were document previously would be acceptable. Closest historic nest to the project site back in 2013 was a little over 5 miles away. According to MDIFW report they only recorded one nesting pair for this township during their 2018 flight.

---

**From:** Wittig, Thomas W <thomas\_wittig@fws.gov>  
**Sent:** Wednesday, March 11, 2020 1:33 PM  
**To:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>; McCollough, Mark <mark\_mccollough@fws.gov>  
**Cc:** Lin, Mao <Mao.Lin@tetrattech.com>; Mahaney, Wende <wende\_mahaney@fws.gov>  
**Subject:** Re: [EXTERNAL] RE: Moscow Renewable Energy Project

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Hi Derek,

I'm sorry that missed your question in your other recent email on this topic. I think I've also muddled this project a bit in mind with other recent projects.



The 2018 MDIFW aerial survey data is recent enough that it should still provide a fairly accurate representation of the nest locations around the landscape. However, as I think Mark pointed out recently, 2018 saw late winter storms that knocked down or otherwise caused failure of a high number of nests. As a consequence, the data may somewhat underestimate the extent of nesting activity across the state.



If it were a choice between using your flight time to survey the Kennebec River or the immediate project area, I would advocate the project area. There's far less risk of take associated with a nest on the river versus on one of the neighboring ponds. Just based on aerial imagery, a few of those nearby ponds look almost large enough to attract nesting eagles. I also notice though in the same imagery that there seems to be a decent network of logging roads out to the ponds. The most efficient plan may simply be to do a spot check of the nearest and largest ponds while you're out in the field for your other eagle surveys this spring.

I recognize this may not be the 'yes or no' you were looking for. Feel free to shoot an email back or give me a call if you like to discuss more.

Thanks,  
Tom

---

**From:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>  
**Sent:** Thursday, April 30, 2020 12:05 PM  
**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Cc:** Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>; McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Subject:** Re: [EXTERNAL] RE: Updated USFWS Guidance on Extent of Aerial Eagle Nest Surveys for Wind Energy Projects

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Crossed wires! Glad to see we arrived at the same conclusion 😊

---

**From:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>  
**Sent:** Thursday, April 30, 2020 12:03 PM  
**To:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Cc:** Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Subject:** Re: [EXTERNAL] RE: Updated USFWS Guidance on Extent of Aerial Eagle Nest Surveys for Wind Energy Projects

Hi Derek,

As Mark and Wende mention, it's difficult for us to get clearance to fly normally. With the pandemic, it's next to impossible right now. I sincerely appreciate the offer though.

Please do feel free to give me a call if you have any questions about the new aerial nest survey guidance. I know it's a bit awkward that this information is arriving mid-season.

This updated guidance can effectively be viewed the same as other standards of the original ECP Guidance. Projects are not obligated to survey out to this distance, or even survey at all. However, if they'd like an accurate gauge of how exposed nesting eagles might be to their project, and if they'd like to say they're following current Service recommendation, aerial surveys out to 2 miles are now the standard.

You are obviously still free to survey out to 4 miles, and I do agree with Mark that there is still value in that, but you can now consider that range above and beyond. I think in instances of policy change, the Service's philosophy is typically that we don't expect those that were following our old guidance to jump through extra hoops. If changing gears and bringing your survey area down to 2 miles involves extra work at this point, don't worry about.

Again, please let me know if you have any questions.

Thank you,  
Tom

---

**From:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Sent:** Thursday, April 30, 2020 11:29 AM  
**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Cc:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>; Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Subject:** Re: [EXTERNAL] RE: Updated USFWS Guidance on Extent of Aerial Eagle Nest Surveys for Wind Energy Projects

Derek: I suggest that you touch base briefly with Tom. I don't think it hurts anything to survey out to 4 miles. I also note that the wording in the guidance seems related to whether you have an Eagle Act permit (which the wind company does not) and Eagle Conservation Plan (which the wind company has). I am not sure if the 2 mile recommendation applies to all circumstances. Tom could clarify.

Thanks for the offer to fly, but USFWS has very strict rules about flying, certifications and training, and who we can fly with....and Covid-19, so we will pass on the flight.

Thanks, Mark

Mark McCollough, Ph.D.  
Endangered Species Biologist  
Maine Field Office, U. S. Fish and Wildlife Service  
306 Hatchery Way  
East Orland, Maine 04431  
Office phone: 207 902-1570  
Cell phone: 207 944-5709



*Kate Furbish...I have wandered alone for the most part...called 'crazy,' a 'fool'...The flowers being my only society and the manuals the only literature for months together. Happy, happy hours!*

---

**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Thursday, April 30, 2020 8:42 AM  
**To:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Cc:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>; Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Subject:** [EXTERNAL] RE: Updated USFWS Guidance on Extent of Aerial Eagle Nest Surveys for Wind Energy Projects

Thanks Mark.

I left off Brooke and Kara on this reply.

We received these guidelines from one of our internal raptor biologist last week and that is a pretty big difference in radius and a lot less flight time.

I have discussed our scouting/flight plans for the Moscow project with Tom a month or so ago and we were already scoped to fly out to a 4 mile radius regardless following MDIFW guidelines for great blue herons. So with previous data to go on we are doing a hybrid eagle/heron flight. Currently, we have started to scout the various different ponds and lakes for eagle nests from the ground.

Not sure if any of you are interested but we do have one seat available for the Heron/Eagle Helicopter flight scheduled for May 14 (back up date May 21) with Maine Helicopter. We have offered up a seat to the state too but haven't received a response. Flight does require N95 masks and gloves due to distance.

Thanks and hope are staying safe during these times

Derek

**From:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Sent:** Thursday, April 30, 2020 8:03 AM  
**To:** Moody, Kara <[Kara.Moody@stantec.com](mailto:Kara.Moody@stantec.com)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; Barnes, Brooke <[brooke.barnes@stantec.com](mailto:brooke.barnes@stantec.com)>  
**Cc:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>; Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Subject:** Fw: Updated USFWS Guidance on Extent of Aerial Eagle Nest Surveys for Wind Energy Projects

**⚠ CAUTION:** This email originated from an external sender. Verify the source before opening links or attachments. ⚠

Hi all:

We just received the following guidance from Tom Wittig, USFWS Eagle Act coordinator for our Northeast Region. New guidelines recommend reduce the distance of nest surveys from 10 miles to 2 miles from wind energy projects. See the rationale and guidance in the emails attached to Tom's email.

It is eagle nest survey time, so we realize that you are getting ready to do surveys (or perhaps already have completed them). If you have any questions, please contact Tom for guidance. His phone number is 413-253-8577.

Thanks, Mark

Mark McCollough, Ph.D.  
Endangered Species Biologist  
Maine Field Office, U. S. Fish and Wildlife Service  
306 Hatchery Way  
East Orland, Maine 04431  
Office phone: 207 902-1570  
Cell phone: 207 944-5709



*Kate Furbish...I have wandered alone for the most part...called 'crazy,' a 'fool'...The flowers being my only society and the manuals the only literature for months together. Happy, happy hours!*

---

**From:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>  
**Sent:** Tuesday, April 28, 2020 10:14 AM  
**To:** 'Call, Erynn' <[Erynn.Call@maine.gov](mailto:Erynn.Call@maine.gov)>  
**Cc:** Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>; McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Subject:** Updated USFWS Guidance on Extent of Aerial Eagle Nest Surveys for Wind Energy Projects

Hi Erynn,

Hope you've been doing well.

I wanted to share that the Service has updated its guidance regarding aerial eagle nest surveys for wind energy projects. Whereas the Service previously recommended aerial surveys out to 10 miles of the project footprint, it is now advising surveys only out to 2 miles.

The attached documents, which formalize and explain this change, are also available on our national website: <https://www.fws.gov/birds/management/managed-species/eagle-management.php>

Please let me know if you have any questions.

Thank you,  
Tom



- - -

**Tom Wittig**

Eagle Coordinator | North Atlantic-Appalachian Region  
Division of Migratory Birds | U.S. Fish and Wildlife Service  
300 Westgate Center Drive  
Hadley, MA 01035  
Phone: 413-253-8577  
Fax: 413-253-8424

---

**From:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>  
**Sent:** Tuesday, November 3, 2020 5:24 PM  
**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Subject:** Re: [EXTERNAL] Moscow Eagles Update

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Hello Derek,

Thank you for reaching out. I appreciate the update.

Under the Eagle Rule regulations, a permit application for a wind energy project is technically considered incomplete if it does not include two years of pre-construction data. The Service can offer waivers to this requirement, but only under relatively limited circumstances.

Practically speaking, it is also to an applicant's benefit to have two years of data in hand before applying simply because it decreases likelihood that subsequent take estimates/authorizations are too low or too high. This consideration is particularly relevant in areas where there is high inter-annual variation in eagle use.

I think it'd be good to discuss this a little more over the phone. For my part, I'd like to get a better sense for client's timelines and expectations for the project.

Would you be available for a call tomorrow (Wednesday) or Thursday?

Best,

Tom

---

**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Tuesday, November 3, 2020 12:56 PM  
**To:** Wittig, Thomas W <[thomas\\_wittig@fws.gov](mailto:thomas_wittig@fws.gov)>; McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Subject:** [EXTERNAL] Moscow Eagles Update

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Hi Tom/Mark-

I wanted to reach out and give you a quick update on eagle use surveys to date on the Moscow Wind Project. We are approaching the end of year 1 monitoring with eagle use surveys finishing up next month and then will begin analyzing the data and reporting. As mentioned previously, survey effort was pretty heavy up there with MDIFW asking for twice weekly surveys during spring and fall to augment the monthly eagle use surveys and all that information will be used on the exposure calculations. We believe the site is low risk to eagles and expect the collision risk models will be able to show that once we run the model (likely end of Dec/early Jan). Eagle aerial surveys did not turn up an eagle nests within our flight radius this year either. The client is expecting to file permit application sometime in February. Does the client need to account for conducting surveys another year or what is the next prudent step so I can advise them correctly.

I would be happy to chat as well.

Thanks



**Derek Hengstenberg, CWB®** | Senior Ecologist/ Project Manager  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**From:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>  
**Sent:** Tuesday, July 21, 2020 8:05 AM  
**To:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>  
**Cc:** Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Boyden, Sarah <[Sarah.Boyden@maine.gov](mailto:Sarah.Boyden@maine.gov)>; Todd, Charlie <[Charlie.Todd@maine.gov](mailto:Charlie.Todd@maine.gov)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Settele, Rebecca <[Rebecca.Settele@maine.gov](mailto:Rebecca.Settele@maine.gov)>  
**Subject:** RE: Rocky/Talus - Moscow Renewable Energy Project Study Plan

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Good morning Jim,

Shevenell asked that I forward the results of the map layer review for known Rocky/Talus areas on the Moscow site to aid in your survey plans. As you review it, remember that MDIFW guidance recommends documentation of features of  $\geq 1,000$  ft<sup>2</sup> in size on and within 250 feet of solar project sites and  $\geq \frac{1}{2}$ -acre in size within 3 miles for wind projects. The Moscow Renewable Energy Project proposes both solar and wind energy. At some point, we will want to revisit resource concerns and survey plans comprehensively but, in the interim, here is the information on this resource. Let us know if you have any questions or concerns. Thank you, Bob.

**Bob Stratton**  
**Wildlife Biologist**  
**Environmental Program Manager**  
Maine Department of Inland Fisheries & Wildlife  
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Augusta, Maine 04333-0041  
(207) 287-5659  
[mefishwildlife.com](http://mefishwildlife.com)

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**From:** Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>  
**Sent:** Thursday, July 16, 2020 1:56 PM  
**To:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>  
**Subject:** FW: Moscow Renewable Energy Project Study Plan

Hi Bob,

Becca was able to determine that no talus overlapped the Moscow proposed project footprint. Attached is the map of the project area and closest talus features, which are ~1,300 ft away. Would you be able to forward this information on to your contact at Moscow or TetraTech?

Thanks, Shevenell

**Shevenell Webb**  
**Furbearer and Small Mammal Biologist**  
Maine Department of Inland Fisheries & Wildlife  
Wildlife Division  
650 State St.  
Bangor, ME 04401  
(207) 941-4473  
[mefishwildlife.com](http://mefishwildlife.com) | [facebook](https://www.facebook.com/mefishwildlife) | [twitter](https://twitter.com/mefishwildlife)

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**From:** Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>  
**Sent:** Tuesday, August 4, 2020 4:50 PM  
**To:** Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>  
**Cc:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Subject:** FW: Rocky/Talus - Moscow Renewable Energy Project Study Plan

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Hi Shevenell,

Thanks for providing us with the results of your map layer review for known rocky/talus areas around the proposed Moscow Renewable Energy Project. We are currently discussing your findings internally and we want to make sure we understand the implications. Could you help us by answering the following questions?

- Can you confirm that we need to take into consideration  $\geq\frac{1}{2}$ -acre talus fields or rocky/talus areas (identified in the attached map provided by MDIFW) within 3 miles even if they do not overlap with our proposed project area?
- Do all  $\geq\frac{1}{2}$ -acre talus fields or rocky/talus areas within 3 miles of the Project need to undergo acoustic monitoring, or just those areas that exhibit suitable habitat (i.e. habitats similar to MDIFW's Representative Photographs of Suitable Bat Rock-Roosting Sites)? Also, please let me know if the attached is the most recent version of the bat rock-roosting document.
- Does MDIFW have guidance on the number of detectors per acre of suitable bat rock-roosting habitat? The 2018 wind guidance indicates one detector per feature so we want to make sure our coverage is spatially adequate.
- Does MDIFW have a preferred field survey protocol or data form for assessing/documenting bat rock-roosting habitat?
- Is the *Maine Cliff and Talus Areas* data layer available for download or can you share it with us so we can run GIS calculations and develop field maps?
- We submitted a study plan to MDIFW on 6/22/2020 (file: Patriot\_Moscow\_StudyPlan\_2020-06\_18Final.pdf) that included preliminary plans for acoustic monitoring for bat hibernacula. Will we need to send a new hibernacula study plan to MDIFW for review and approval?
- The 2018 wind guidance recommends at least 2 years of pre-construction acoustic monitoring for rocky/talus areas. We anticipate that we can successfully perform the work required for mid-November through December 2020 and Spring 2021 and still meet our client's timeline to make



the project financially feasible. Is the 2 year requirement negotiable pending the results of our study?

Thanks in advance! Your responses will help us figure out an approximate level of effort in order to develop a scope of work for our client.

Mao

**Mao Lin** | Wildlife Biologist

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**From:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>

**Sent:** Tuesday, August 18, 2020 8:13 AM

**To:** Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>

**Cc:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Boyden, Sarah <[Sarah.Boyden@maine.gov](mailto:Sarah.Boyden@maine.gov)>

**Subject:** RE: Rocky/Talus - Moscow Renewable Energy Project Study Plan

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Good morning Mao,

We at MDIFW have discussed, and I am writing to respond to, your questions below.

1. Yes, as noted in the Maine Wind Power Guidance (2018), MDIFW recommends consideration of  $\geq\frac{1}{2}$ -acre talus fields or rocky outcrops, or cliffs visible from remote imagery, within 3 miles of a proposed wind project area because of potential interactions between at-risk bats and turbines. This distance is subject to revision with ongoing research. Further, as noted in the Maine Solar Energy Guidance (2020), MDIFW recommends consideration of similar features of  $\geq 1,000$  square feet, on and within 250 feet of a proposed solar project site.
2. MDIFW recommends that areas meeting these physical descriptions be documented, with detailed photographs and coordinates submitted to MDIFW for review. Please keep us in the loop regarding survey plans and on-the-ground photos of the rocky features. It would be helpful if the biologists submit a list of rocky features found, locations visited, description of what was found, and several corresponding photos from each site. MDIFW will recommend which, if any, need acoustic monitoring. Certainly, the consultant may offer recommendations based their field observations. The

example photographs provided to you are current but, as noted, *“Photographs are for guidance only and should not be considered all-inclusive”*.

3. The 2018 guidance provides a general recommendation of a minimum of one detector at each feature. The actual number of detectors will vary depending on site conditions and configurations to ensure coverage of the feature. The consultant should offer recommendations based on the capabilities of monitoring equipment.

4. We do not have a formal data form at this time, but Shevenell Webb can provide further guidance.

5. I understand that *Maine Cliff and Talus Areas* is in the public domain and that the layers and/or maps have been provided. If they do not encompass the full recommended three mile distance, please advise and MDIFW will correct this.

6. As noted above, it is expected that desktop analyses, field observations, and agency consultation will determine areas in need of acoustic monitoring. As such, we recommend that the survey plan reflect the processes and investigations necessary.

7. As noted, the Maine Wind Power Guidance (2018) recommends at least 2 years of pre-construction acoustic monitoring. It is premature to determine the necessary monitoring period until the processes and information described in #2 above are addressed. If MDIFW determines that no suitable habitat areas are present, then no acoustic monitoring will be needed. If monitoring is conducted and conclusive positive results soon discovered, monitoring may be concluded in a shorter period. If monitoring is conducted and inconclusive results obtained, it is anticipated that additional monitoring may be needed. If the timeframe is of significant concern, you may consider identifying potentially suitable habitats, assuming bat presence without acoustic monitoring, and incorporating appropriate siting and operational measures accordingly. MDIFW can discuss this option with you further, if desired.

As you plan for project operations, I want to remind you of MDIFW’s position on turbine curtailment for the protection of the eight species of Endangered, Threatened, and Special Concern bats in Maine. As noted in the Wind Power Guidance, *“in most circumstances based on current research and recent project reviews, MDIFW recommends that turbines operate only at cut-in wind speeds exceeding 6.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period April 15 –September 30, whenever the ambient air temperature is at or above 32 degrees Fahrenheit, measured at both ground level and nacelle hub height. Proximity to hibernacula, documented maternity sites, rocky features, the coastal mainland, and migration patterns, may increase risks and thus possibly necessitate additional safeguards, such as extended timeframes (earlier and/or later) and/or higher wind speeds.”* *“Additionally, based on higher bat mortality during July – September demonstrated through post-construction project monitoring in Maine and research elsewhere, applicants can anticipate a need for increased curtailment wind speeds during this period.”*

MDIFW is open to discussing alternate proposals that can be demonstrated as appropriately protective of at-risk bat species. As example of this, please recall our discussions of two recent wind energy projects that incorporated 6.0 m/s curtailment regimens during most of the April 15 –September 30 season. One adopted a July 16 – September 15 curtailment speed of 6.9 m/s, while the other adopted a curtailment speed of 6.5 m/s during the same time period. Based on the levels of protection anticipated for bats by these proposals, MDIFW agreed to an Incidental Take Plan/Permit for the first project and to forego post-construction mortality monitoring for both projects. For a third project with documented winter bat activity in the vicinity, MDIFW recommended a turbine curtailment season of April 1 through October 31. As a reminder, the planned investigations of rocky features as potential bat hibernacula in the vicinity of the project site will help determine if buffers, increased curtailment wind speeds, and/or an increased curtailment season length are necessary, but the need for curtailment itself is known based on the historical distribution of bats in Maine. As with all resource issues, MDIFW is available to

meet with your representatives to discuss these issues.

I hope this addresses your questions; let us know of any further questions or concerns. Please include John and me on all project correspondences and both Shevenell and Sarah on those related to bats. Thank you, Bob.

**Bob Stratton**

**Wildlife Biologist**

**Environmental Program Manager**

Maine Department of Inland Fisheries & Wildlife

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(207) 287-5659

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---

**From:** Lin, Mao

**Sent:** Tuesday, August 18, 2020 9:43 AM

**To:** Stratton, Robert D <Robert.D.Stratton@maine.gov>

**Cc:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>; Perry, John <John.Perry@maine.gov>; Webb, Shevenell <Shevenell.Webb@maine.gov>; Boyden, Sarah <Sarah.Boyden@maine.gov>

**Subject:** RE: Rocky/Talus - Moscow Renewable Energy Project Study Plan

Good morning Bob,

Thank you for your thorough responses to all of our questions. I believe we have enough information to proceed with our planning and discussions with our client. If we have additional questions or follow-up information about this topic, we will respond back on this thread.

Thanks,

Mao

**Mao Lin** | Wildlife Biologist

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**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Thursday, September 10, 2020 8:27 AM  
**To:** Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>; Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>  
**Cc:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Boyden, Sarah <[Sarah.Boyden@maine.gov](mailto:Sarah.Boyden@maine.gov)>  
**Subject:** RE: Rocky/Talus - Moscow Renewable Energy Project Study Plan

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Good Morning Bob-

We are planning out the rocky/talus reckon survey and due to the 3 mile radius from each turbine we are running into new landowner access issues as this radius goes beyond Patriot's land control and are looking into our options but this is a concern and wanted to let you know about it.

Mao and I were talking and wondering if it would be okay to do a subset survey of talus/slopes of properties that we have permission to access and get a sense of what is out there, then work with MDIFW on coming up with a survey plan, and then deploy acoustic units at appropriate locations later this fall.

Happy to set up a quick call and chat but the plan was to conduct the reckon survey in the next three weeks or so and have this phase of the survey wrapped up by Oct 1 to begin working with you all on which features may require additional sampling.

Thanks

Derek

**Derek Hengstenberg, CWB®** | Senior Ecologist/ Project Manager  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**From:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>  
**Sent:** Wednesday, September 23, 2020 1:21 PM  
**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>  
**Cc:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Boyden, Sarah <[Sarah.Boyden@maine.gov](mailto:Sarah.Boyden@maine.gov)>  
**Subject:** RE: Rocky/Talus - Moscow Renewable Energy Project Study Plan

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Good afternoon Derek,

My apologies for the delayed reply. Your idea seems reasonable to us. Go ahead and do surveys of rocky features/talus/slopes on properties where you have permission and do desktop surveys elsewhere

for now. Afterwards we can review your findings, recommendations, and decide about any acoustic surveys, additional sampling, etc. Are you planning to survey features of  $\geq 1,000$  square feet since the project includes both wind and solar components or had you planned to distinguish between the project types? In response to information gained since we issued the 2018 Wind Guidance and in the interest of consistency, we're looking at revising our recommendations to include features of  $\geq 1,000$  square feet for both types of projects, but maintaining the different survey distances based on differing operational concerns. Would a revision at this time affect your survey work? Thanks, Bob.

**Bob Stratton**

**Wildlife Biologist**

**Environmental Program Manager**

Maine Department of Inland Fisheries & Wildlife

284 State Street; 41 State House Station

Augusta, Maine 04333-0041

(207) 287-5659

[mefishwildlife.com](http://mefishwildlife.com)

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**From:** Lin, Mao

**Sent:** Wednesday, September 23, 2020 2:27 PM

**To:** Stratton, Robert D <Robert.D.Stratton@maine.gov>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>

**Cc:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Perry, John <John.Perry@maine.gov>; Webb, Shevenell <Shevenell.Webb@maine.gov>; Boyden, Sarah <Sarah.Boyden@maine.gov>

**Subject:** RE: Rocky/Talus - Moscow Renewable Energy Project Study Plan

Hi Bob,

Thanks for responding. Our Project Area changed recently and our client is no longer proposing a solar component. All of our GIS analyses for the hibernacula study have been based on rocky features/talus/slopes  $\geq 0.5$  acre within a 3-mile radius of each of 14 turbines. That said, we did not exclude any features since they were all already  $\geq 0.5$  acre i.e we do not have any features smaller than 1,000 square feet to consider.

We will send you our findings for your review after we conclude our desktop and field-based assessments.

Thanks!

Mao

**Mao Lin** | Wildlife Biologist

Direct (207) 358-2384 | Main (207) 358-2400 | Fax (207) 879-9481 | E-mail: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)



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**From:** Lin, Mao

**Sent:** Tuesday, October 20, 2020 2:49 PM

**To:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Sarah Boyden ([sarah.boyden@maine.gov](mailto:sarah.boyden@maine.gov)) <[sarah.boyden@maine.gov](mailto:sarah.boyden@maine.gov)>; Beyer, Jim R <[Jim.R.Beyer@maine.gov](mailto:Jim.R.Beyer@maine.gov)>

**Cc:** Todd Presson <[tpresson@jaycashman.com](mailto:tpresson@jaycashman.com)>; John Kennedy <[jkennedy@jaycashman.com](mailto:jkennedy@jaycashman.com)>; Parker Hadlock <[PHADLOCK@cianbro.com](mailto:PHADLOCK@cianbro.com)>; Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>

**Subject:** Moscow Renewable Energy Project Hibernacula Reconnaissance

Hi Bob,

Please find attached a memo describing Tetra Tech's reconnaissance study of rocky features within a 3-mile radius of the Moscow Renewable Energy Project. In summary, we conducted a desktop review and drone-based aerial photography survey and determined that there are no features in the Study Area that would provide suitable winter habitat for bats. We conclude, pending MDIFW review and concurrence, that no further studies are warranted. We respectfully request an expedited review in order to allow ample time to prepare the proper reports and permit materials according to our Project timeline.

If you have any questions or comments, or if you would like more information or to discuss this topic in more detail, please contact me at this email address or on my mobile number at 917-687-5838.

Thanks,

Mao

**Mao Lin** | Wildlife Biologist  
Direct (207) 358-2384 | Main (207) 358-2400 | Fax (207) 879-9481 | E-mail: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

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451 Presumpscot St., Portland, ME 04103 | [tetrattech.com](http://tetrattech.com)



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---

**From:** Lin, Mao

**Sent:** Wednesday, November 4, 2020 3:38 PM

**To:** Stratton, Robert D <Robert.D.Stratton@maine.gov>; Perry, John <John.Perry@maine.gov>; Webb, Shevenell <Shevenell.Webb@maine.gov>; Sarah Boyden (sarah.boyden@maine.gov) <sarah.boyden@maine.gov>; Beyer, Jim R <Jim.R.Beyer@maine.gov>

**Cc:** Todd Presson <tpresson@jaycashman.com>; John Kennedy <jkennedy@jaycashman.com>; Parker Hadlock <PHADLOCK@cianbro.com>; Cassida, Jim <Jim.Cassida@tetrattech.com>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>

**Subject:** RE: Moscow Renewable Energy Project Hibernacula Reconnaissance

Hi Bob,

I wanted to follow up again on MDIFW's review of the Moscow bat hibernacula memo that we delivered on October 20. As you are aware, the seasonal window for winter acoustic hibernacula surveys begins soon, so your timely feedback is paramount. Once we receive MDIFW's review and recommendations, we will possibly need additional time to discuss those recommendations, and then we will need time to contact the appropriate landowners to get permission to monitor for bats on their land. Additionally, we will need time to prepare equipment and field staff. Please let me know when we can expect a response to the memo.

On a related note, since our last correspondence we have completed our analysis of acoustic data from our northern long-eared bat survey. In summary, we deployed 30 full-spectrum acoustic detector stations in July within suitable summer habitat and, after manually vetting all high frequency calls, northern long-eared bats were not confirmed present in the Project Area.

We can provide any additional information that you might need and we can address any comments or questions that you or your staff might have.

Thanks,

Mao

**Mao Lin** | Wildlife Biologist

Direct (207) 358-2384 | Main (207) 358-2400 | Fax (207) 879-9481 | E-mail: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

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---

**From:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>

**Sent:** Thursday, November 5, 2020 8:54 AM

To: Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>

Cc: Todd Presson <[TPresson@jaycashman.com](mailto:TPresson@jaycashman.com)>; jkenedy <[jkenedy@jaycashman.com](mailto:jkenedy@jaycashman.com)>; PHADLOCK <[PHADLOCK@cianbro.com](mailto:PHADLOCK@cianbro.com)>; Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Boyden, Sarah <[Sarah.Boyden@maine.gov](mailto:Sarah.Boyden@maine.gov)>; Damon, Jessica <[Jessica.Damon@maine.gov](mailto:Jessica.Damon@maine.gov)>

Subject: RE: Moscow Renewable Energy Project Hibernacula Reconnaissance

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Good morning Mao,

MDIFW has reviewed the Moscow Renewable Energy Project – Bat Hibernacula Reconnaissance Study provided on October 20, 2020, and offers the following observations and recommendations.

MDIFW and Tetra Tech have had a number of productive discussions this year related to recommended resource surveys for the proposed Moscow Renewable Energy Project site. Recently, on September 10, 2020, Tetra Tech informed MDIFW that it was experiencing landowner access issues in conducting potential bat habitat surveys out to the recommended distance of three miles from proposed turbine locations. Tetra Tech inquired about conducting *“a subset survey of talus/slopes of properties that we have permission to access and get a sense of what is out there, then work with MDIFW on coming up with a survey plan, and then deploy acoustic units at appropriate locations later this fall.”* On September 23, 2020, MDIFW agreed with the plan to *“do surveys of rocky features/talus/slopes on properties where you have permission and do desktop surveys elsewhere for now. Afterwards we can review your findings, recommendations, and decide about any acoustic surveys, additional sampling, etc.”*

The above referenced report notes that, because of landowner concerns, a drone was used to explore all rocky features. The report identified 49 rocky features in the study area and provided the mean slope, mean aspect, elevation, area, and estimated canopy closure for each. Photographs were also provided however, as they were obtained from Google Earth aerial photography and drone photography at heights of approximately 400 feet and with 81%-100% canopy closure at all sites, analysis of the sites is difficult, if not impossible.

MDIFW's August 18, 2020 correspondence recommended, *“that areas (of talus fields or rocky outcrops, or cliffs visible from remote imagery) be documented, with detailed photographs and coordinates submitted to MDIFW for review. Please keep us in the loop regarding survey plans and on-the-ground photos of the rocky features. It would be helpful if the biologists submit a list of rocky features found, locations visited, description of what was found, and several corresponding photos from each site.”* MDIFW also provided example photographs for guidance. MDIFW understands that there were issues with landowner access, thus necessitating the use of a drone. However, the photographic evidence submitted does not allow for a sufficient analysis of these areas. Pursuant to our recommendations, we anticipated several corresponding, detailed, on-the-ground/near-view photographs and detailed characterizations of each rocky feature.

1. A high elevation photograph was provided for each identified feature. Are there additional photographs, especially with closer, less obstructed views, available that can provide further value in this analysis?



2. Based on an understanding of the information and visual characterizations requested, were any other potential features noted and photographed along the flight paths to previously known mapped features?

3. What information was used to inform the assessment that none of the 49 features provide suitable winter habitat for bats?

4. Of the current photographs, MDIFW's Shevenell Webb and Sarah Boyden request further information on site conditions at photo sites 1, 7, 8, 9, and 10.

5. If the above issues cannot provide for more comprehensive analyses, MDIFW recommends resurveying deciduous and mixed covertype areas during leaf-off conditions and collection of information as noted above to provide a better indication of ground conditions and potential suitability as winter habitat.

At this time, MDIFW is unable to concur with the report's finding of "*no features in this Study Area that would provide suitable winter habitat for bats*" or that no further studies are warranted. Though, we are hopeful to be able to properly address these questions in the near future. We look forward to your responses to the above information requests and recommendations. Please let us know of any questions or concerns.

Thank you, Bob.

**Bob Stratton**

**Wildlife Biologist**

**Environmental Program Manager**

Maine Department of Inland Fisheries & Wildlife

284 State Street; 41 State House Station

Augusta, Maine 04333-0041

(207) 287-5659

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---

**From:** Lin, Mao

**Sent:** Tuesday, November 10, 2020 3:43 PM

**To:** Stratton, Robert D <Robert.D.Stratton@maine.gov>

**Cc:** Todd Presson <TPresson@jaycashman.com>; jkennedy <jkennedy@jaycashman.com>; PHADLOCK <PHADLOCK@cianbro.com>; Cassida, Jim <Jim.Cassida@tetrattech.com>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>; Perry, John <John.Perry@maine.gov>; Webb, Shevenell <Shevenell.Webb@maine.gov>; Boyden, Sarah <Sarah.Boyden@maine.gov>; Damon, Jessica <Jessica.Damon@maine.gov>

**Subject:** RE: Moscow Renewable Energy Project Hibernacula Reconnaissance

Hi Bob,

The Moscow Renewable Energy Project team has reviewed your comments from November 5, 2020 and has the following responses to your questions and comments, along with the attached photo log and Google Earth file. Tetra Tech maintains that no features in the Study Area would provide suitable winter habitat for bats, with the consideration that there are better habitats with better solar exposure to which they can migrate. We hope that the attached photo log and Google Earth file provides sufficient data for a more comprehensive analysis.

#### MDIFW Question 1

A high elevation photograph was provided for each identified feature. Are there additional photographs, especially with closer, less obstructed views, available that can provide further value in this analysis?

#### Tetra Tech Response 1

Thank you for understanding our need and decision to use a drone for the memo we submitted on October 20, 2020. Since our last correspondence we were able to obtain landowner permission to access the parcels on foot. The attached photo log contains an overview map of each of the rocky features highlighted by MDIFW and annotated on-the-ground photographs of those features taken by Tetra Tech biologists. We hope these photographs are more sufficient for review by MDIFW.

#### MDIFW Question 2

Based on an understanding of the information and visual characterizations requested, were any other potential features noted and photographed along the flight paths to previously known mapped features?

#### Tetra Tech Response 2

There were no other potential features noted and photographed during the drone survey within a 3-mile radius of each of the proposed turbines in the project. Our biologists did note, however, that there are potentially suitable features outside of the 3-mile radius on the southwest slope of Black Nubble and Moxie Mountain. This area is clearly visible from aerial photographs and not entirely captured by the model provided by MDIFW.

#### MDIFW Question 3

What information was used to inform the assessment that none of the 49 features provide suitable winter habitat for bats?

#### Tetra Tech Response 3

Tetra Tech's review of available literature indicated that research is limited on the environmental variables associated with winter habitat for bats that use rocky features. Available research suggests, however, that sun exposure is important since thermoregulation drives roost selection (see Moosman et al. 2015 and 2019, and Ingalls et al. 2017). This is consistent with MDIFW's *Representative Photographs of Suitable Bat Rock-Roosting Sites* that exhibits only photographs of exposed rocks with minimal leaf litter (with the understanding that these photographs are not all-inclusive). We determined that the best assessment we could make using only aerial and drone photography was to search for sites with southern exposure and limited canopy cover. We conducted our review of aerial photography with the mindset

that the imagery could be out-of-date and that forested habitat in this area can be quickly converted through storms, beaver activity, and timber harvesting. Thus, a drone survey would provide the latest aerial view of the modeled rocky features at a lower height. The drone survey confirmed that all 49 of the modeled features provided by MDIFW are still covered by trees and, therefore, finding a warm place to hibernate for the winter would be an issue for bats. We also took into account that bats can travel for many miles to find suitable hibernacula and it seemed unlikely that they would choose an area with fairly thick forest. Additional details and citations are provided in the Results and Discussion section of Tetra Tech's October 20, 2020 memo.

#### MDIFW Question 4

Of the current photographs, MDIFW's Shevenell Webb and Sarah Boyden request further information on site conditions at photo sites 1, 7, 8, 9, and 10.

#### Tetra Tech Response 4

Thank you for this important feedback! Tetra Tech biologists have visited these areas on foot and taken photographs. Please note the following cross-walk between photo sites and Talus ID:

Photo 1 = Talus ID 4413

Photos 7, 8, and 9 = Talus ID 4432 and 4380

Photo 10 = Talus ID 4454 and 4460

The attached photo log includes an overview map for each Talus ID with photo points, and the attached Google Earth file includes only the rocky features highlighted by MDIFW and the locations of the photo points associated with each feature.

#### MDIFW Question 5

If the above issues cannot provide for more comprehensive analyses, MDIFW recommends resurveying deciduous and mixed covertype areas during leaf-off conditions and collection of information as noted above to provide a better indication of ground conditions and potential suitability as winter habitat.

#### Tetra Tech Response 5

Thank you for your feedback. Tetra Tech maintains that no features in the Study Area would provide suitable winter habitat for bats, with the consideration that there are better habitats with better solar exposure to which they can migrate. We hope that the attached photo log and Google Earth file provides sufficient data for a more comprehensive analysis. Please note that during Tetra Tech's ground-based visit, we used a high-lumen LED flashlight to investigate cracks and crevices. This is consistent with recommendations in Moosman et al. 2019.

Thanks again for your thorough review and we look forward to getting your feedback in a timely manner so we can, if necessary, deploy acoustic detectors for three weeks during the November 15–December survey window. Please let me know if we can provide you with any additional information (higher resolution photographs, GIS files, etc.).

Mao

---

**From:** Lin, Mao

**Sent:** Monday, November 16, 2020 9:50 AM

**To:** 'Stratton, Robert D' <Robert.D.Stratton@maine.gov>

**Cc:** Todd Presson <TPresson@jaycashman.com>; jkennedy <jkennedy@jaycashman.com>; PHADLOCK <PHADLOCK@cianbro.com>; Cassida, Jim <Jim.Cassida@tetratech.com>; Hengstenberg, Derek

<Derek.Hengstenberg@tetrattech.com>; 'Perry, John' <John.Perry@maine.gov>; 'Webb, Shevenell' <Shevenell.Webb@maine.gov>; 'Boyden, Sarah' <Sarah.Boyden@maine.gov>; 'Damon, Jessica' <Jessica.Damon@maine.gov>

**Subject:** RE: Moscow Renewable Energy Project Hibernacula Reconnaissance

Hello Bob,

I noted last week when I sent out our responses to your comments that you were out of the office until today. We are hoping that you will have time to review our ground-based photo log today or otherwise early this week to provide us with your feedback. We have staff heading up to the site this week for eagle surveys Thursday-Friday. Depending on your feedback, we could deploy detectors on the same trip, and that will ensure that the detectors can be out for the recommended three-week period during MDIFW's prescribed seasonal window. Of course, our assessment is still that although there are rocky features present, most of them are not suitable as winter habitat for bats due to poor solar exposure, the abundance of leaf litter (duff/detritus/etc.), and because bats are capable of migrating to more suitable habitat.

We look forward to hearing from you soon and I hope you had a nice long weekend!

Mao

---



**From:** Stratton, Robert D <[Robert.D.Stratton@maine.gov](mailto:Robert.D.Stratton@maine.gov)>

**Sent:** Monday, November 16, 2020 4:46 PM

**To:** Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>

**Cc:** Todd Presson <[TPresson@jaycashman.com](mailto:TPresson@jaycashman.com)>; jkennedy <[jkennedy@jaycashman.com](mailto:jkennedy@jaycashman.com)>; PHADLOCK <[PHADLOCK@cianbro.com](mailto:PHADLOCK@cianbro.com)>; Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>; Perry, John <[John.Perry@maine.gov](mailto:John.Perry@maine.gov)>; Webb, Shevenell <[Shevenell.Webb@maine.gov](mailto:Shevenell.Webb@maine.gov)>; Boyden, Sarah <[Sarah.Boyden@maine.gov](mailto:Sarah.Boyden@maine.gov)>; Damon, Jessica <[Jessica.Damon@maine.gov](mailto:Jessica.Damon@maine.gov)>

**Subject:** RE: Moscow Renewable Energy Project Hibernacula Reconnaissance

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Good afternoon Mao,

We have reviewed the additional photos and information provided. We appreciate and want to acknowledge the effort undertaken by the Tetra Tech team to document and provide the information necessary for MDIFW's review of this issue. Upon review of these additional materials and based on information currently available, MDIFW believes that this project site appears to provide only marginal overwintering habitat for bats. Given the apparent limitations of the site and limited bat activity during the November 15 to December survey window, we do not believe that acoustic surveys are warranted during this period. Further, we do not request additional photographic surveys related to winter bat habitat at this site.

Identifying the properties of rocky features/talus slopes that are suitable as hibernacula in Maine is an emerging issue and the focus of current research. Accordingly, MDIFW's recommendations in this area

are subject to change in the future as additional information becomes available. We are hopeful for more defining information in the near future. We hope this addresses your needs. Please let us know of any further questions or concerns. Thank you,

**Bob Stratton**  
**MDIFW**

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**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Wednesday, December 11, 2019 1:55 PM  
**To:** Todd Presson <TPresson@jaycashman.com>; Cassida, Jim <Jim.Cassida@tetrattech.com>; John Kennedy <jkennedy@jaycashman.com>  
**Cc:** Parker Hadlock <PHADLOCK@cianbro.com>; 'Lauren Walsh' <LLOHN@cianbro.com>; Lin, Mao <Mao.Lin@tetrattech.com>  
**Subject:** RE: Moscow Renewable Energy Project

Hello all-

Yes, I thought it was a really productive scoping meeting and timing is excellent. I had a good conversation with Mark yesterday and appreciate him taking time to discuss with me before he headed out on holiday. He wasn't aware of the latest development at Moscow so I provided him a little background of where things are now and general plan going forward.

In the end he felt a lynx camera trap and incidental tracking would be useful to conduct this winter. Regarding consultation and involvement, he mentioned he would like to actively participate in agency meetings and agency consultation as he has a history evaluating it over its various iterations and would like to be directly invited to meetings and such where relevant going forward. I told him that should not be a problem and we value his input.

He differed me to the eagle coordinator in Hadley to discuss eagles at the site and I haven't been able to connect with him yet so I am assuming they will likely ask for eagle use surveys. Both of these surveys are not surprising given potential siting of turbines outside of the fields, continued succession of project site habitats and newer ECP guidance for wind energy projects. For planning purposes, we would begin winter surveys in January.

Thanks

Derek

**Derek Hengstenberg, CWB®** | Project Manager/ Wildlife Biologist  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Friday, January 24, 2020 12:43 PM  
**To:** Todd Presson <TPresson@jaycashman.com>; Parker Hadlock <PHADLOCK@cianbro.com>; John Kennedy <jkennedy@jaycashman.com>; LLOHN@cianbro.com  
**Cc:** Lin, Mao <Mao.Lin@tetrattech.com>; Cassida, Jim <Jim.Cassida@tetrattech.com>  
**Subject:** Moscow Renewable Energy- Canada Lynx update

Good afternoon-

I wanted to provide a quick update on the lynx survey that we are conducting at Moscow. Following guidance from Mark McCollough at USFWS we deployed 7 game cameras a few weeks ago at the site following the attached survey plan. Yesterday, we revisited the site for our first check to download data the cameras and conduct some incidental tracking as well as perform an eagle survey. The crew picked up two different sets of lynx tracks as they were travelling between camera locations. No lynx were found on the cameras during this check but the lynx tracks were 25m and 150m away from the nearest cameras. Mark McCollough asked for us to let him know if we encounter any tracks or record any photos of Lynx. We don't think it's a big deal and not a surprising find in that region but he may suggest some additional surveys.

Let us know if we should chat about it before we inform USFWS of the finding (early next week would be our target to inform him).

Thanks

**Derek Hengstenberg, CWB®** | Project Manager/ Wildlife Biologist  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Wednesday, February 12, 2020 10:17 AM  
**To:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Parker Hadlock <PHADLOCK@cianbro.com>  
**Cc:** Todd Presson <TPresson@jaycashman.com>; John Kennedy <jkennedy@jaycashman.com>; Lauren Walsh <LLOHN@cianbro.com>; Lin, Mao <Mao.Lin@tetrattech.com>  
**Subject:** RE: Moscow Renewable Energy Project -Lynx Surveys

Hi All-

As requested by USFWS I will touch base with Mark McCollough about the findings and see if there are any modifications needed to the winter surveys.

Thanks

---

**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Tuesday, March 10, 2020 9:44 AM  
**To:** Wittig, Thomas <thomas\_wittig@fws.gov>; Mahaney, Wende <wende\_mahaney@fws.gov>; 'mark\_mccollough@fws.gov' <Mark\_McCollough@fws.gov>  
**Cc:** Lin, Mao <Mao.Lin@tetrattech.com>  
**Subject:** FW: Moscow Renewable Energy Project

Hello Mark, Wende, Tom -

Well- it certainly felt like spring yesterday with temps in the 60's in Portland. We received MDIFW recommendations on what additional natural resource surveys are needed at the Moscow Renewable Energy Project this year. We have already begun to implement weekly golden eagle surveys into our regime which also helps fulfill the monthly eagle use survey component that we started this earlier this winter (no eagles to report yet). So we will have a lot more survey effort in addition to the ongoing eagle use surveys. We are using the same two points from the eagle use surveys for these additional golden eagle surveys.

MDIFW has requested a great blue heron aerial rookery survey within a 4 mile radius of the site (May 1 to June 15) and has deferred the need for Eagle Nest Surveys to the USFWS. So I think we will be flying for the great blue heron survey this spring to satisfy that condition and adding in eagle survey into survey would be doable but timing might be off a bit.

Let me know if we need to set up a call to chat. We could also discuss anything else related to this project. As Mark knows already, we have picked up lynx on the game cameras.

Thanks

Derek

---

**From:** Parrish, Clinton <Clinton.Parrish@tetrattech.com>  
**Sent:** Friday, May 1, 2020 1:44 PM  
**To:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>; Lin, Mao <Mao.Lin@tetrattech.com>  
**Subject:** Lynx camera survey at Moscow

A single lynx was detected in the 4/14-4/30 survey interval at station 4. This is the second time and location where a cat has scent marked the post. Pretty neat.

Also, I pulled two of the stations. Station 5 because it's adjacent to a wetland/stream and water levels are up, and I didn't think animals would be using that edge any longer (sure enough, no animals on SD card). Station 1 because the camera was turned off and the SD card was missing. There was a fresh set of boot tracks on the road. Thought it was better to pull the camera before someone else did.

Jim/Derek,

**How much longer should we leave the cameras out?** It's a pretty light effort although picture review and tallies take a few hours for each two-week period. ~ 5-6 hours for check and data review every two weeks. I began going through all photos and compiling tallies in mid-March to increase efficiency. It seemed like a "quick scan" for lynx pictures was kind of a waste of time if all photos would have to be reviewed at a later date anyhow.

**Clint Parrish** | Biologist  
Direct (207) 358-2392 | Mobile (410) 596-5103 | [clinton.parrish@tetrattech.com](mailto:clinton.parrish@tetrattech.com)

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**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Friday, May 1, 2020 2:04 PM  
**To:** Parrish, Clinton <Clinton.Parrish@tetrattech.com>; Cassida, Jim <Jim.Cassida@tetrattech.com>; Lin, Mao <Mao.Lin@tetrattech.com>  
**Subject:** RE: Lynx camera survey at Moscow

Thanks for the update Clint. USFWS asked us to keep the cameras out if we can but that extra bit of checking can add up. Jim- once the TCA are in we can look at the budgets and see what remains and make a call when to pull the remaining ones.

Interesting they just took the card. Are the cameras locked up?

---

**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Tuesday, June 2, 2020 1:08 PM  
**To:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>; Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Subject:** [EXTERNAL] FW: Moscow Renewable Energy Project-

Hi Mark/Wende-

I wanted to follow up with you regarding this new project layout basically an additional string of 9 turbines and evaluating T&E species specifically Canada lynx and northern long-eared bat. As you are aware we are still conducting a camera trap survey up at the site and still have 5 of the original 7 cameras still out but the cameras do not cover the new additional string of turbines.

How would you like us to proceed regarding our evaluation of lynx at the site? We are providing Patriot an update on what additional work may be needed and your input would be great.



I also plan to reach out to Tom on the eagle front regarding this additional string.

Happy to chat with you all about it.

Thanks  
Derek

---

**From:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>  
**Sent:** Wednesday, June 3, 2020 8:09 AM  
**To:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Cc:** Mahaney, Wende <[wende\\_mahaney@fws.gov](mailto:wende_mahaney@fws.gov)>  
**Subject:** Re: [EXTERNAL] FW: Moscow Renewable Energy Project

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Hi Derek:

This may be the first project in Maine that installs turbines in an area where there is a regular presence of lynx. There was only one photo of a lynx at the Bingham project, if I recall correctly. Kibby was questionable ridgetop habitat, although Dana Valleau did some snowtrack surveys after the project was constructed and picked up several tracks.

It is uncertain how lynx respond to wind projects. Does construction and operation displace lynx from an area or do they become accustomed to the changes in the landscape and remain? This question will come up in our section 7 consultation (do you know yet whether there will be wetland impacts triggering a Corps permit?). For that reason, I would encourage you to continue to maintain your existing cameras in the "first" turbine area and add several cameras to the "expanded" turbine area. It would be valuable to gather baseline information on lynx use in the area and continue to monitor use during construction and operation. Cameras are a relatively low cost way to gather information. There may be some methods to do quantitative analysis of the lynx photos.

You haven't photographed bobcats at the site, correct?

Let me know if you want to discuss further.

Mark

Mark McCollough, Ph.D.  
Endangered Species Biologist  
Maine Field Office, U. S. Fish and Wildlife Service  
306 Hatchery Way  
East Orland, Maine 04431  
Office phone: 207 902-1570  
Cell phone: 207 944-5709



*Kate Furbish...I have wandered alone for the most part...called 'crazy,' a 'fool'...The flowers being my only society and the manuals the only literature for months together. Happy, happy hours!*

---

**From:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>  
**Sent:** Friday, November 6, 2020 9:36 AM  
**To:** 'Mark\_McCollough@fws.gov' <Mark\_McCollough@fws.gov>; Mahaney, Shawn B CIV USARMY CENAE (USA) <Shawn.B.Mahaney@usace.army.mil>  
**Cc:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Lin, Mao <Mao.Lin@tetrattech.com>  
**Subject:** Moscow Renewable Energy Project - Lynx

Hello Mark/Shawn-

We have wrapped up nearly one year of camera trap surveys at the Moscow site and as you are aware lynx have been document on site.

We would like to setup a conference call to chat about next steps.

Do you have time next week?

Thanks

**Derek Hengstenberg, CWB®** | Senior Ecologist/ Project Manager  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**From:** McCollough, Mark <mark\_mccollough@fws.gov>  
**Sent:** Wednesday, January 6, 2021 9:56 AM  
**To:** Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>; Mahaney, Shawn B CIV USARMY CENAE (USA) <Shawn.B.Mahaney@usace.army.mil>  
**Cc:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Lin, Mao <Mao.Lin@tetrattech.com>; Waddle, Kelly <Kelly.Waddle@tetrattech.com>; Todd Presson <TPresson@jaycashman.com>  
**Subject:** Re: [EXTERNAL] Western Maine Renewable Energy Project- Canada Lynx report

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Hi Derek:

You lynx report arrived while I was out on Holiday leave. Just wanted to confirm receipt and that I will read the report as soon as possible.

Thanks, Mark

Mark McCollough, Ph.D.  
Endangered Species Biologist  
Maine Field Office, U. S. Fish and Wildlife Service  
306 Hatchery Way  
East Orland, Maine 04431  
Office phone: 207 902-1570  
Cell phone: 207 944-5709



*Kate Furbish...I have wandered alone for the most part...called 'crazy,' a 'fool'...The flowers being my only society and the manuals the only literature for months together. Happy, happy hours!*

---

**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Thursday, December 17, 2020 1:10 PM  
**To:** McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>; Mahaney, Shawn B CIV USARMY CENAE (USA) <[Shawn.B.Mahaney@usace.army.mil](mailto:Shawn.B.Mahaney@usace.army.mil)>  
**Cc:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>; Waddle, Kelly <[Kelly.Waddle@tetrattech.com](mailto:Kelly.Waddle@tetrattech.com)>; Todd Presson <[TPresson@jaycashman.com](mailto:TPresson@jaycashman.com)>  
**Subject:** [EXTERNAL] Western Maine Renewable Energy Project- Canada Lynx report

**This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.**

Hello Mark-

Attached is a draft Canada Lynx report for the Western Maine Renewable Energy Project (formerly known as Moscow Renewable Energy Project).

Once you have a chance to review we would like to set up a conference call in early January to discuss.

Let us know if you have any questions.

Thanks

Derek

**Derek Hengstenberg, CWB®** | Senior Ecologist/ Project Manager  
Direct 207-358-2401 | Business 207-358-2400 | Mobile 908-616-0436 | [derek.hengstenberg@tetrattech.com](mailto:derek.hengstenberg@tetrattech.com)

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**From:** Hengstenberg, Derek <[Derek.Hengstenberg@tetrattech.com](mailto:Derek.Hengstenberg@tetrattech.com)>  
**Sent:** Thursday, January 28, 2021 9:57 AM  
**To:** Cassida, Jim <[Jim.Cassida@tetrattech.com](mailto:Jim.Cassida@tetrattech.com)>; Lin, Mao <[Mao.Lin@tetrattech.com](mailto:Mao.Lin@tetrattech.com)>  
**Cc:** Waddle, Kelly <[Kelly.Waddle@tetrattech.com](mailto:Kelly.Waddle@tetrattech.com)>  
**Subject:** RE: Western Maine Wildlife Report

Wildlife report is in my hands and with prioritizing priorities I had to push my review. When do you want it by? I should have time after this week to put towards it and will help with hours next week and will send over a draft.

I did talk with Mark yesterday about Lynx and we chatted about Moscow. He is limited with time and hasn't reviewed the report yet but there are a few more action items now that we received a touch of input.

- 1) He would like us to conduct an GIS evaluation of habitat at the project site to site what type and how much habitat will be altered by the project (temp and long term impacts). Likely this is being calculated for others tasks? He said this will be helpful for the corp and USFWS evaluation of the project for lynx and such.
- 2) Consider pollinators (i.e. Monarch Butterfly). Mao and I had already discussed this and this would be included as part of the plan. He wanted to make sure that in terms of mitigation that any need seedings and such to think about native seeds and such for pollinators.

As pThis is part of the wildlife habitat assessment task that we have funding for but haven't done much and have been waiting for USFWS input so this is good.

and I don't think we have completed that which is probably good as it all has been changing but he will like to see this.

Kelly- can you work with GIS to get this process started once the final layout has been complete.

**From:** [Lin, Mao](#)  
**To:** ["St.Hilaire, Lisa"; maine.nap@maine.gov](#)  
**Cc:** [Cassida, Jim](#); [Hengstenberg, Derek](#); [Waddle, Kelly](#); [Damon, Jessica](#); ["Zeh, Sally"](#); ["Puryear, Kristen"](#)  
**Subject:** Western Maine Renewable Energy Project Significant Botanical Resources Information Request  
**Date:** Friday, February 12, 2021 8:38:00 AM  
**Attachments:** [RE RESPONSE Moscow Renewable Energy Significant Botanical Resources Information Request.msg](#)  
[MNAP\\_Request\\_WMREP\\_20210212.pdf](#)  
[WMRE\\_20210202\\_STUDY\\_AREA.kmz](#)  
[image002.png](#)  
[image004.png](#)  
[image006.png](#)

---

Dear Maine Natural Areas Program,

Last summer we submitted a request for Significant Botanical Resources for the Moscow Renewable Energy Project. Since that time, the Project has evolved into the Western Maine Renewable Energy Project and the applicant name has been updated to Western Maine Renewables, LLC. In addition, the solar component of the Project has been removed and the Project Area has changed.

I have attached our previous correspondence, a revised letter, and a .kmz with the updated Project Area. We respectfully request a follow-up review from your program to address the changes in the Project Area, particularly the potential addition of new access roads and pads to support radar assisted lighting towers. Please let me know if this is sufficient for you to complete your review. If you need additional information to aid in your review, please contact me at (917) 687-5838 or email me at [mao.lin@tetratech.com](mailto:mao.lin@tetratech.com).

Thanks,

Mao

**Mao Lin** | Wildlife Biologist

Direct (207) 358-2384 | Main (207) 358-2400 | Fax (207) 879-9481 | E-mail: [mao.lin@tetratech.com](mailto:mao.lin@tetratech.com)

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February 12, 2021

Maine Natural Areas Program  
177 State House Station  
Augusta, ME 04333-0177

Sent via email: [maine.nap@maine.gov](mailto:maine.nap@maine.gov)

**Subject: Significant Botanical Resources Information Request**

Dear Maine Natural Areas Program,

On behalf of Western Maine Renewables, LLC (the Applicant), this letter is to request any information the Maine Natural Areas Program may have on rare and unique botanical features including the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities in or around the proposed Western Maine Renewable Energy Project (the Project) area which includes the decommissioned United States Air Force Radar Installation in the towns of Moscow and Caratunk, Somerset County, Maine. To aid in the review, a .kmz of the Project area is attached. Tetra Tech is supporting the Applicant with evaluating this site for a proposed wind energy facility.

Please review the project area and identify any known or suspected locations of rare and unique botanical features within the outlined area associated with this proposed development. If you have any questions or require additional information regarding this request please contact me directly at (917) 687-5838 or email me at [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com).

Thank you for your time and attention.

Respectfully Submitted,

**TETRA TECH, INC.**

A handwritten signature in black ink that reads 'Mao Lin'.

Mao Lin, Wildlife Biologist

Enclosure –Project Area .kmz

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Tetra Tech, Inc.  
451 Presumpscot Street, Portland, ME 04103  
Tel 207-358-2402 Fax 207-879-9481 [www.tetrattech.com](http://www.tetrattech.com)

## Lin, Mao

---

**From:** St.Hilaire, Lisa <Lisa.St.Hilaire@maine.gov>  
**Sent:** Thursday, March 4, 2021 11:38 AM  
**To:** Lin, Mao  
**Cc:** Cassida, Jim; Hengstenberg, Derek; Waddle, Kelly; Damon, Jessica; Zeh, Sally; Puryear, Kristen  
**Subject:** RE: Western Maine Renewable Energy Project Significant Botanical Resources Information Request  
**Attachments:** tetrattech\_moscow\_westernmainerenewables.pdf

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Hi Mao,

MNAP comments attached. Thank you,

### Lisa St. Hilaire

Information Manager | Maine Natural Areas Program  
Department of Agriculture, Conservation and Forestry  
177 State House Station | Augusta, ME 04333 (mailing address)  
90 Blossom Lane | Augusta, ME 04333 (physical address)  
**PHONE 207-287-8044** | FAX 287-7548 (FAX)

---

**From:** Lin, Mao <Mao.Lin@tetrattech.com>  
**Sent:** Friday, February 12, 2021 8:39 AM  
**To:** St.Hilaire, Lisa <Lisa.St.Hilaire@maine.gov>; NAP, Maine <Maine.NAP@maine.gov>  
**Cc:** Cassida, Jim <Jim.Cassida@tetrattech.com>; Hengstenberg, Derek <Derek.Hengstenberg@tetrattech.com>; Waddle, Kelly <Kelly.Waddle@tetrattech.com>; Damon, Jessica <Jessica.Damon@maine.gov>; Zeh, Sally <Sally.Zeh@Maine.Gov>; Puryear, Kristen <Kristen.Puryear@maine.gov>  
**Subject:** Western Maine Renewable Energy Project Significant Botanical Resources Information Request

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Dear Maine Natural Areas Program,

Last summer we submitted a request for Significant Botanical Resources for the Moscow Renewable Energy Project. Since that time, the Project has evolved into the Western Maine Renewable Energy Project and the applicant name has been updated to Western Maine Renewables, LLC. In addition, the solar component of the Project has been removed and the Project Area has changed.

I have attached our previous correspondence, a revised letter, and a .kmz with the updated Project Area. We respectfully request a follow-up review from your program to address the changes in the Project Area, particularly the potential addition of new access roads and pads to support radar assisted lighting towers. Please let me know if this is sufficient for you to complete your review. If you need additional information to aid in your review, please contact me at (917) 687-5838 or email me at [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com).

Thanks,

Mao

**Mao Lin** | Wildlife Biologist



Direct (207) 358-2384 | Main (207) 358-2400 | Fax (207) 879-9481 | E-mail: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

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**STATE OF MAINE**  
**DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY**  
 177 STATE HOUSE STATION  
 AUGUSTA, MAINE 04333

**JANET T. MILLS**  
 GOVERNOR

**AMANDA E. BEAL**  
 COMMISSIONER

March 4, 2021

Mao Lin  
 Tetra Tech  
 451 Presumpscot Street  
 Portland, ME 04103

Via email: [mao.lin@tetrattech.com](mailto:mao.lin@tetrattech.com)

Re: Rare and exemplary botanical features in proximity to: Western Maine Renewables, 2021 study area, Moscow, Maine

Dear Mr. Lin:

I have searched the Maine Natural Areas Program’s Biological and Conservation Data System files in response to your request received February 12, 2021 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Moscow, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. MNAP recommends that you have the site surveyed by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed. In particular, MNAP recommends that you survey project areas for Goldie’s Wood Fern, Red-stemmed Gentian, and Clinton’s Bulrush. All three species occur in close proximity to the revised project area, along the right-of-way that heads to the southeast, and it appears that suitable habitat may be present in the revised project area, including in proposed and existing right-of-way areas and proposed turbine locations.

Feature	State Status	State Rank	Global Rank	Notes
Goldie’s Wood Fern <i>Dryopteris goldiana</i>	Special Concern	S2	G4G5	Extant at ROW South of Deadwater Radar Station, may be present in other project areas
Red-stemmed Gentian <i>Gentiana rubricaulis</i>	Threatened	S1	G4?	Extant at ROW South of Beaudoin Road, may be present in other project areas
Clinton’s Bulrush <i>Trichophorum clintonii</i>	Special Concern	S3	G4	Extant at ROW near Chase Stream, may be present in other project areas

**MOLLY DOCHERTY, DIRECTOR**  
 MAINE NATURAL AREAS PROGRAM  
 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-804490  
 WWW.MAINE.GOV/DACF/MNAP

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program  
207-287-8043 | [kristen.puryear@maine.gov](mailto:kristen.puryear@maine.gov)

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## Maine Natural Areas Program

### *Dryopteris goldiana* (Hook. ex Goldie) Gray

#### Goldie's Wood Fern

- [State Rank](#): S2
- [Global Rank](#): G4
- [State Status](#): Special Concern

**Habitat:** Rich mostly calcareous woods. [Hardwood to mixed forest (forest, upland)]

**Range:** Southeastern Canada to the Carolinas; Tennessee, Iowa, and Minnesota.

**Aids to Identification:** Goldie's wood-fern has a short, creeping rhizome and large, deep green leaves in a crown-like cluster 1-1.5 m high. The twice-divided leaves are about 3/4 broad as long at the base, tapering quickly to a point. The stalk is covered with distinct shiny brown scales about 2.5 cm long.



**Ecological characteristics:** Known in Maine from rich hardwood forests.

**Phenology:** Sori apparent in July - August, fronds evergreen.

**Family:** Polypodiaceae

**Synonyms:** *Aspidium goldianum* Hook. ex Goldie.

**Known Distribution in Maine:** This rare plant has been documented from a total of 26 town(s) in the following county(ies): Aroostook, Franklin, Kennebec, Oxford, Penobscot, Piscataquis, Somerset.

**Reason(s) for rarity:** Habitat naturally scarce.

**Conservation considerations:** Effects of logging are not well known; partial removal of the canopy would be less likely to adversely affect the plant than would complete canopy removal.



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22 State House Station  
18 Elkins Lane  
Augusta, ME 04333  
More [Locations](#)  
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Fax: (207) 287-2400  
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[DACF@Maine.gov](mailto:DACF@Maine.gov)



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## Maine Natural Areas Program

### *Gentiana rubricaulis* Schwein.

#### Red-stemmed Gentian

- [State Rank](#): S1
- [Global Rank](#): G4?
- [State Status](#): Threatened

**Habitat:** Moist woods, wet meadows, and shores, especially nongranitic substrates.



**Family:** Gentianaceae

**Synonyms:** *Dasystephana grayi* (Kusnez.) Britt; *Gentiana linearis* Froel. ssp. *rubricaulis* (Schwein.) J. Gillet; *Gentiana linearis* Froel. var. *lanceolata* Gray; *Gentiana linearis* Froel. var. *latifolia* Gray.

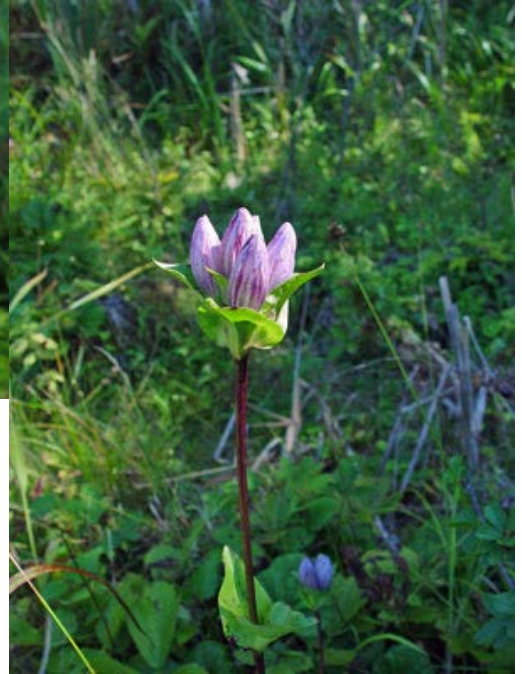


**Range:** Isolated stations in Maine and New Brunswick; otherwise Ontario to Saskatchewan, Minnesota, Wisconsin, Michigan, and Nebraska.

**Phenology:** Flowers August to September.



**Known Distribution in Maine:** This rare plant has been documented from a total of 6 town(s) in the following county(ies): Kennebec, Somerset.



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Department of Agriculture,  
Conservation and Forestry  
22 State House Station  
18 Elkins Lane  
Augusta, ME 04333  
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Phone: (207) 287-3200  
Fax: (207) 287-2400  
TTY Users Call Maine Relay  
711  
[DACE@Maine.gov](mailto:DACE@Maine.gov)



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## Maine Natural Areas Program

### *Trichophorum clintonii* (Gray) S.G. Smith

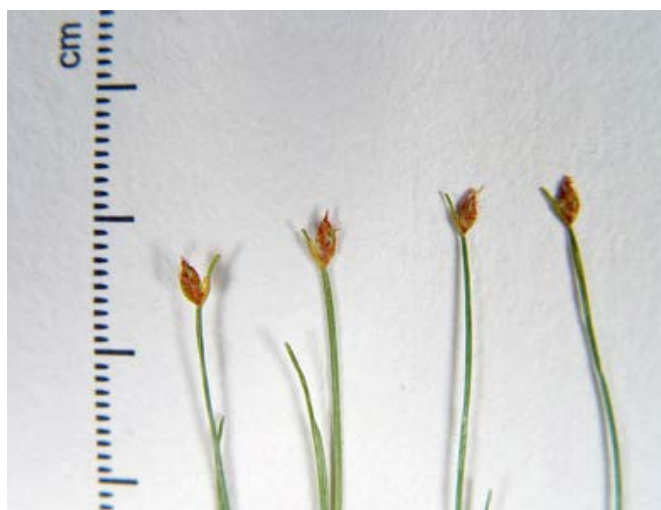
#### Clinton's Bulrush

- [State Rank](#): S3
- [Global Rank](#): G4
- [State Status](#): Special Concern

**Habitat:** Dry or springy argillaceous or slaty ledges, gravel or open woods and turfy shores. [Open wetland, not coastal nor rivershore (non-forested, wetland); Non-tidal rivershore (non-forested, seasonally wet)]

**Range:** Quebec and New Brunswick to New York and Minnesota .

**Aids to Identification:** Members of the genus *Trichophorum* are sedges with solitary, terminal spikelets subtended by an enlarged scale. The achenes, which lack tubercles possessed by spikerushes, are subtended by 3-6, brown or white, perianth bristles. This short bulrush characteristically grows in dense, low tufts. The lower sheaths are bladeless, the upper bearing leaves shorter than the stem. The terminal spikelet is 4-5 mm wide and has 4-7 flowers. The achenes (fruits) are pale brown, 3-angled, and 1.4-2 mm wide. The triangular stem (in cross section) separates this from the very similar *T. cespitosum*, which has a round stem. Also closely related to *T. alpinum*, it can be distinguished by its brown bristles about 2 mm long.



**Ecological characteristics:** This species has been found in Maine growing on calcareous, ledgy shores.

**Phenology:** Perennial. Fruits May - July.

**Family:** Cyperaceae

**Synonyms:** *Baeothyron cespitosum* (L.) A. Dietr.; *Scirpus clintonii* Gray.

**Known Distribution in Maine:** This rare plant has been documented from a total of 23 town(s) in the following county(ies): Aroostook, Kennebec, Penobscot, Piscataquis, Somerset.

**Reason(s) for rarity:** At southern limit of range.

**Conservation considerations:** Known populations are small, but not currently subject to any particular human threat; it seems to persist on the few river ledges where it grows. Heavy recreational use of ledges could pose problems.

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Department of Agriculture,  
Conservation and Forestry  
22 State House Station  
18 Elkins Lane  
Augusta, ME 04333

## Rare and Exemplary Botanical Features within 4 miles of Project: Western Maine Renewable Energy Project, Moscow, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Bulrush Sedge						
	SC	S2	G5	2001-08-31	7	Rocky summits and outcrops (non-forested, upland), Non-tidal rivershore (non-forested, seasonally wet)
Circumneutral Outcrop						
	<null>	S2	GNR	2001-08-31	9	Rocky summits and outcrops (non-forested, upland)
Clinton's Bulrush						
	SC	S3	G4	2001-08-31	23	Open wetland, not coastal nor rivershore (non-forested, wetland), Non-tidal rivershore (non-forested, seasonally wet)
	SC	S3	G4	2018-07-12	36	Open wetland, not coastal nor rivershore (non-forested, wetland), Non-tidal rivershore (non-forested, seasonally wet)
Goldie's Wood Fern						
	SC	S2	G4G5	2018-07-12	31	Hardwood to mixed forest (forest, upland)
Hemlock Forest						
	<null>	S4	G4G5	2001-08-22	20	Conifer forest (forest, upland), Hardwood to mixed forest (forest, upland)
Hyssop-leaved Fleabane						
	SC	S2	G5	1906-07	16	Non-tidal rivershore (non-forested, seasonally wet), Rocky summits and outcrops (non-forested, upland)
New England Violet						
	SC	S2	G4	1925-07-07	14	Non-tidal rivershore (non-forested, seasonally wet)
Red-stemmed Gentian						
	T	S1	G4?	1902-08-29	2	Open wetland, not coastal nor rivershore (non-forested, wetland), Old field/roadside (non-forested, wetland or upland)
	T	S1	G4?	2018-07-11	8	Open wetland, not coastal nor rivershore (non-forested, wetland), Old field/roadside (non-forested, wetland or upland)
Showy Orchis						
	E	S1	G5	1907-06-13	17	Hardwood to mixed forest (forest, upland)
Spruce - Fir - Northern Hardwoods Ecosystem						

Rare and Exemplary Botanical Features within 4 miles of  
 Project: Western Maine Renewable Energy Project, Moscow, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Sycamore	<null>	S5	GNR	2013-11-01	9	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
White Cedar Woodland	PE	SX	G5	1948-07-13	1	Forested wetland,Hardwood to mixed forest (forest, upland)
	<null>	S2	GNR	2001-08-31	3	Conifer forest (forest, upland),Dry barrens (partly forested, upland)

## STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.
- SU** Under consideration for assigning rarity status; more information needed on threats or distribution.
- SNR** Not yet ranked.
- SNA** Rank not applicable.
- S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

**Note:** **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

## GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.
- GNR** Not yet ranked.

**Note:** **Global Ranks** are determined by NatureServe.

## STATE LEGAL STATUS

**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered and Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

## NON-LEGAL STATUS

- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.



## ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

**Note:** **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!  
<http://www.maine.gov/dacf/mnap>





## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588

<http://www.fws.gov/mainefieldoffice/index.html>

In Reply Refer To:

February 12, 2021

Consultation Code: 05E1ME00-2021-SLI-0657

Event Code: 05E1ME00-2021-E-02010

Project Name: Western Maine Renewable Energy Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: [http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html) Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: <http://www.fws.gov/mainefieldoffice/Project%20review4.html>

Additionally, wind energy projects should follow the wind energy guidelines: <http://www.fws.gov/windenergy/> for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm> and at:

<http://www.towerkill.com>; and at:

<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
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## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Maine Ecological Services Field Office**

P. O. Box A

East Orland, ME 04431

(207) 469-7300

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## Project Summary

Consultation Code: 05E1ME00-2021-SLI-0657

Event Code: 05E1ME00-2021-E-02010

Project Name: Western Maine Renewable Energy Project

Project Type: POWER GENERATION

Project Description: Western Maine Renewables, LLC, a joint venture between Patriot Renewables, LLC and Cianbro Development Corporation, proposes to construct the Western Maine Renewable Energy Project (Project), a 14-turbine utility-scale wind energy facility located in the Town of Moscow, Somerset County, Maine. The proposed Project is located approximately 5 miles northeast of the center of the village of Moscow on land currently composed of forested timberland and the remnants of a former United States Air Force long-range, over-the-horizon backscatter radar transmitter station. The wind facility will have an installed capacity of 58.8 megawatts of electricity.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@45.1467491,-69.86817632207223,14z>



Counties: Somerset County, Maine

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## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/3652">https://ecos.fws.gov/ecp/species/3652</a>	Threatened
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Fishes

NAME	STATUS
Atlantic Salmon <i>Salmo salar</i> Population: Gulf of Maine DPS There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/2097">https://ecos.fws.gov/ecp/species/2097</a>	Endangered

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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