CENTRAL MAINE POWER

July 1, 2019

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

RE: **New England Clean Energy Connect Project**
Updated Section 404 Clean Water Act Application Package

Dear Mr. Clement:

Central Maine Power Company (CMP) is pleased to provide an updated application package, pursuant to Section 404 of the Clean Water Act (CWA), associated with the Department of the Army Permit application, number NAE-2017-01342, submitted by CMP on September 29, 2017 for the New England Clean Energy Connect (NECEC) project (the "Project"). This updated application package was prepared in response to the U.S. Environmental Protection Agency's (USEPA) April 25, 2019 comments in response to the USACE Public Notice issued for the Project and the USACE's May 15, 2019 additional information request. In its comments, the USEPA recommended that CMP submit an updated application that consolidated its proposal to date.

The USEPA also requested a revised alternatives analysis fully considering a range of alternatives and indicated that the compensatory mitigation plan needed additional information on mitigation for secondary impacts to streams and on the threat of development of the proposed preservation parcels. The updated application materials address each of these items.

The USEPA's comments also requested further assessment and description of the project's cumulative impacts. CMP anticipates that the NEPA document, to be prepared by the USACE in compliance with 40 CFR 230.11(g) and 40 CFR 1508.7, RGL 84-9, will include a cumulative effects assessment that considers how the direct and indirect environmental effects of the proposed Project incrementally contribute to the cumulative effects associated with past, present, and reasonably foreseeable future actions, and will assess whether or not that incremental contribution is significant. In response to the foreseeable future actions, CMP has stated previously that it has no plans for another transmission line within the NECEC corridor. Speculation that ownership of a 300-foot-wide corridor virtually guarantees a full build-out is not supported by the history of CMP's transmission line ownership.

Since its original application filing in 2017, CMP has responded to multiple requests for additional information. Each of these has been previously provided to the USACE. Nevertheless, CMP is happy to provide copies of these responses to consulting parties upon request.

CENTRAL MAINE POWER

The USEPA's comments also included a request for copies or links to the final minutes of state public hearings. This information will be provided by CMP under separate cover and will include the transcripts of these hearings; copies of CMP witnesses' and supporting intervenors' pre-filed direct, rebuttal, supplemental, and sur-rebuttal testimony; and a response to an MDEP information request generated as a result of the hearings. CMP anticipates providing this information by Friday, July 5, 2019.

CMP appreciates the USEPA's comments on the NECEC application and its ongoing review of the Project. After the USACE and USEPA have had an opportunity to review this updated application package, CMP will coordinate a meeting to facilitate the federal agencies' ongoing review.

If you have any questions regarding this submittal, please give me a call at (207) 629-9717 or email gerry.mirabile@cmpco.com.

Sincerely,

Gerry J. Mirabile

Gerry J. Mirabile
Manager – NECEC Permitting
AVANGRID Networks, Inc.

Enclosures

cc: Beth Alafat, Mark Kern, Mike Marsh - USEPA
Melissa Pauley – USDOE

File: New England Clean Energy Connect

NECEC U.S. Army Corps of Engineers Updated Section 404 Clean Water Act Application Package

Central Maine Power Company

New England Clean Energy Connect (NECEC) Project

7/1/2019

NECEC U.S. Army Corps of Engineers
Updated Section 404 Clean Water Act Application Package

submitted to

U.S. Army Corps of Engineers

New England Clean Energy Connect (NECEC) Project

7/1/2019

submitted by

Central Maine Power Company
83 Edison Drive
Augusta, ME 04336

prepared by

Burns & McDonnell Engineering Company, Inc.
Portland, Maine

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
AC	Alternating current
ANST or AT	Appalachian National Scenic Trail or Appalachian Trail
APE	Area of Potential Effects
ATC	Appalachian Trail Conservancy
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMPs	Best Management Practices
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CFR	Code of Federal Regulations
CMP	Central Maine Power
CPCN	Certificate of Public Convenience and Necessity
CWA	Clean Water Act
dB	decibels
dBA	Sound Pressure Level
DC	Direct current
Distribution Companies	Collectively Unitil, National Grid and Eversource
DOE	U.S. Department of Energy
DPS	Distinct Population Segment
DWA	Deer Wintering Area
EFH	Essential fish habitat
Environmental Guidelines	Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects

Abbreviation	Term/Phrase/Name
ESA	Endangered Species Act
ESC	Erosion and Sedimentation Control
Eversource	NSTAR Electric Company and Western Massachusetts Electric Company d/b/a Eversource
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Map
FR	Federal Register
GHz	Gigahertz
GIS	Geographic Information System
gpm	Gallons-per-minute
GPS	Global Positioning Systems
HDD	Horizontal Directional Drill
HUC	Hydrological Unit Codes
HVDC	High Voltage Direct Current
ISO-NE	Independent System Operator- New England
kV	Kilovolt
Kwh	Kilowatt hour
LUPC	Maine Land Use Planning Commission
Maine DHHS	Maine Department of Health and Human Services
Massachusetts RFP	Request for Proposals for Long-Term Contracts for Clean Energy Projects
Massachusetts RFP	Mass. Request for Proposals for Long-Term Contracts for Clean Energy Projects
MATC	Maine Appalachian Trail Club

Abbreviation	Term/Phrase/Name
MBTA	Migratory Bird Treaty Act
MCBER	University of Maine's Center for Business & Economic Research
MDEP	Maine Department of Environmental Protection
MDIFW	Maine Department of Inland Fisheries and Wildlife
MEGIS	Maine Office of Geographic Information Systems
MESA	Maine Endangered Species Act
MGS	Maine Geological Survey
MHPC	Maine Historic Preservation Commission
MNAP	Maine Natural Areas Program
MPRP	Maine Power Reliability Program
MPUC	Maine Public Utilities Commission
MVAR	Mega volt amps (reactive)
MW	Megawatts
MWh	Megawatt hour
National Grid	Nantucket Electric Company d/b/a National Grid
NECEC	New England Clean Energy Connect
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRPA	Maine Natural Resource Protection Act
NWI	National Wetland Inventory
O&M	Operation and Maintenance

Abbreviation	Term/Phrase/Name
PEM	Palustrine Emergent Wetlands
PFO	Palustrine Forested Wetlands
POI	Point of Interconnect
PPA	Power Purchase Agreement
PSS	Palustrine Scrub-Shrub Wetlands
ROW	Right of way
RPS	Renewable Portfolio Standard
RTO	Regional Transmission Organization
SEARCH	SEARCH, Inc.
Site Law	Site Location of Development Act
SPCC	Spill Prevention, Control, and Countermeasure
STATCOM	Static Synchronous Compensator
TSA	Transmission Service Agreement
TWh	Terawatt hour
U.S.	United States
Unitil	Fitchburg Gas & Electric Light Company d/b/a Unitil
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
USGS-NHD	U.S. Geological Survey – National Hydrography Dataset

Abbreviation	Term/Phrase/Name
VIA	Visual Impact Assessment
WM&RC	Western Mountains and Rivers Corporation

EXECUTIVE SUMMARY

This Section 404 Clean Water Act ("CWA") application package has been compiled at the request of the U.S. Environmental Protection Agency ("USEPA") in response to its April 25, 2019 comments on the U.S. Army Corps of Engineers ("USACE") March 13, 2019 Public Notice issued for the Central Maine Power Company ("CMP") New England Clean Energy Connect ("NECEC") project (the "Project"). CMP originally submitted applications for a Maine Natural Resources Protection Act ("NRPA") permit, a Maine Site Location of Development Act ("Site Law") permit, and a Federal Water Pollution Control Act Section 401 Water Quality Certification to the Maine Department of Environmental Protection ("MDEP") and the USACE in September 2017. The USACE agreed that CMP's Site Law and NRPA applications were adequate for the purposes of applying for a Department of the Army Individual Permit.

Since the original applications were filed, the MDEP, USACE, and other consulting agencies issued several information requests. In addition, CMP provided updates to its application through multiple filings. The plans, proposals, and supporting documents provided by CMP in response to those data requests are part of CMP's applications. The intent of this application package is to provide an up to date compilation of materials -- from the original applications that were filed in 2017, regarding project modifications submitted by CMP since 2017, and responsive to the numerous requests for information submitted by CMP since 2017 -- relevant to the Section 404 CWA permit review that reflects the Project as currently proposed. Materials that are not, or may not be directly relevant to the Section 404 CWA permit review process are not included, but are available on the MDEP's dedicated NECEC website at http://www.maine.gov/dep/land/projects/necec/index.html or upon request.

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 02-28-2022

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Gerry Middle - J Last - Mirabile Company - Central Maine Power Company E-mail Address - gerry.mirabile@cmpco.com	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Mark Middle - Last - Goodwin Company - Burns & McDonnell E-mail Address - magoodwin@burnsmcd.com
6. APPLICANT'S ADDRESS: Address- 83 Edison Drive City - Augusta State - ME Zip - 04336 Country - USA	9. AGENT'S ADDRESS: Address- 27 Pearl Street, 2nd Floor City - Portland State - ME Zip - 04101 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE a. Residence b. Business (207) 629-9717 c. Fax	10. AGENTS PHONE NOs. w/AREA CODE a. Residence b. Business (207) 517-8482 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Mark Goodwin-Burns&McDonnll to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Gerry J. Mirabile — SIGNATURE OF APPLICANT

7/1/2019 — DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
New England Clean Energy Connect (NECEC), Refer to Section 1.0 (Subsection 1.1.1) - ENG Form 4345 Supplemental Information

13. NAME OF WATERBODY, IF KNOWN (if applicable) Refer to Section 1.1.2 and Attachment B	14. PROJECT STREET ADDRESS (if applicable) Address Not applicable to this linear transmission line project
15. LOCATION OF PROJECT Latitude: ◦N Refer to Section 1.1.3 Longitude: ◦W	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Refer to Section 1.1.3 Municipality
Section - Township - Range -

17. DIRECTIONS TO THE SITE

The proposed Project is a linear transmission line and related improvements in Maine. For Project location information refer to Figures 2-1 through 2-4 in the attached application materials, as well as Project Plans in Attachment A.

18. Nature of Activity (Description of project, include all features)

Refer to Section 1.1.4 and Section 2.0.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

Refer to Section 1.1.9.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Refer to Section 1.2.1.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

Refer to Section 1.2.2.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres Refer to Section 1.2.3.

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Refer to Section 1.2.4, Section 7.0 and Section 9.0.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

Refer to Section 1.2.5.

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- Refer to Section 1.2.6 and Attachment C.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Refer to Section 1.2.7					

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
Gerry L. [illegible]	7/1/2019		

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

1.0 ENG FORM 4345 SUPPLEMENTAL INFORMATION

1.1 Name, Location, and Description of Project or Activity[1]

1.1.1 Block 12: Project Name

CMP proposes to construct the NECEC, a High Voltage Direct Current ("HVDC") transmission line and related facilities capable of delivering up to 1,200 megawatts ("MW") of electric generation from the Canadian border to the ISO-NE electric grid. The project was proposed in response to the Request for Proposals for Long-Term Contracts for Clean Energy Projects dated March 31, 2017 and issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts[2] (the "Massachusetts RFP" or "RFP"). Please refer to Section 2.0 for the Development Description.

1.1.2 Block 13: Names of Waterbodies

NECEC components were surveyed on foot by professional wetland scientists to identify and map all wetlands, surface water bodies, and vernal pools. Further discussion is included in Section 4.4.

The waterbodies are depicted on the Natural Resources Maps in the Project Plans, Exhibit A-2 of Attachment A. The following Exhibits are also contained in Attachment A.

Attachment A
Exhibit A-1- Transmission Line Configuration Cross-Sections
Exhibit A-2- Natural Resources Maps
Exhibit A-3- Aquifer Maps
Exhibit A-4- Floodplain and Soil Series Maps
Exhibit A-5- USGS Location Maps

[1] Blocks 14 and 17 are not applicable to linear electric transmission line projects.
[2] Fitchburg Gas & Electric Light Company d/b/a Unitil ("Unitil"), Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid ("National Grid"), NSTAR Electric Company and Western Massachusetts Electric Company d/b/a Eversource ("Eversource") (collectively, the "Distribution Companies").

The following Exhibits located in Attachment B contain waterbody names, as available, as well as additional information.

Attachment B
Exhibit B-1: Wetland Table
Exhibit B-2: Waterbody Table
Exhibit B-3: SVP Table
Exhibit B-4: USACE Vernal Pool Table

None of the rivers crossed by the transmission line components of the Project is considered navigable, pursuant to Section 10 of the Rivers and Harbors Act, at the crossing location.

1.1.3 Block 15 and 16: Location of Project and Municipalities

This work is proposed in numerous waterways and wetlands:

- Between Beattie Township, Maine (USGS Boundary Pond quadrangle sheet; Lat/Long 45.5165 60°N; - 70.187398°W) and Lewiston, Maine (USGS Lake Auburn East quadrangle sheet; Lat/Long 44.140075°N; - 70.719526°W);

- Between Lewiston (USGS Lake Auburn East quadrangle sheet; Lat/Long 44.140075°N; - 70.719526°W) and Pownal (USGS North Pownal quadrangle sheet; Lat/Long 43.931707°N; - 70.204229°W); and

- Between Windsor (USGS Weeks Mills quadrangle sheet; Lat/Long 44.286523°N; -69.562329°W) and Wiscasset (USGS Westport quadrangle sheet; Lat/Long 43.9532 14°N; -69.696120°W).

The Project area encompasses six Maine counties and 38 municipalities or townships. Please refer to Section 2.0 for the Development Description.

1.1.4 Block 18: Nature of Activity (Description of the Project)

The NECEC consists of the construction of an HVDC electric transmission line from the Québec-Maine border to the point of first interconnection with the New England Transmission System at CMP's existing Larrabee Road Substation in Lewiston, Maine. The Project also includes the rebuild of two existing 115 kilovolt ("kV") transmission lines, a new 345kV transmission line, a direct current ("DC") to alternating current ("AC"), converter station and a new STATCOM substation. To accommodate the new infrastructure a number of modifications to existing facilities will be required, as further described in Section 2.0.

1.1.5 Block 19: Project Purpose

The purpose of the NECEC Project is for CMP to deliver up to 1,200 MW of Clean Energy Generation from Québec to the New England Control Area[3] via an HVDC transmission line, at the lowest cost to ratepayers. The Project is routed on private land that CMP already owns or controls, including existing transmission corridors. The route is shorter than other routes from Québec to New England and represents the lowest-cost path for delivery of Clean Energy Generation[4] from Québec.

The NECEC Project responds to the Massachusetts RFP, which sought 9,450,000 MWh of Clean Energy Generation to be procured through cost-effective long-term contracts. The Project's selection under the RFP demonstrates that Massachusetts has concluded that the NECEC will meet this need. Furthermore, the clean energy delivered by the Project will provide firm, guaranteed, and tracked year-round energy deliveries that will reduce winter electricity price spikes, improve system reliability and resiliency, and provide renewable energy certificates and other environmental attributes to help Massachusetts meet its greenhouse gas ("GHG") emission reduction goals.

CMP will not seek any cost recovery from Maine ratepayers for the Project. Rather the Project will be paid for entirely by Hydro Renewable Energy, Inc. ("HRE"), which is an affiliate of Hydro-Québec, and Massachusetts ratepayers in accordance with Federal Energy Regulatory Commission ("FERC")-approved transmission service agreements ("TSAs").

Further, after considering all the evidence submitted in the Maine Public Utilities Commission ("MPUC") proceeding over the course of a nineteen-month adjudicatory proceeding, the MPUC issued a 100-page order on May 3, 2019 granting a Certificate of Public Convenience and Necessity ("CPCN") for the NECEC.[5] In its Order, the MPUC concluded that the NECEC "will result in significant incremental hydroelectric generation from existing and new resources in Québec and, therefore, will result in

[3] The New England Control Area includes the transmission system administered by ISO-New England, the regional transmission organization (RTO), located in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, but does not include the transmission system in northern Maine (i.e., Aroostook County and parts of Penobscot and Washington counties).

4 Under the terms of the RFP, "Clean Energy Generation" means either: (1) firm service hydroelectric generation from hydroelectric generation alone; (ii) new Massachusetts Class I RPS eligible resources that are firmed up with firm service hydroelectric generation; or (iii) new Massachusetts Class I RPS eligible resources.

5 In the Order, the MPUC found that the CPCN statute requires the MPUC to make specific findings with regard to the public need for the proposed transmission line, taking into account, among other factors, state renewable energy generation goals. MPUC Order at 17. The MPUC also found that Title 38, Chapter 3-A, the climate change statute that establishes GHG reduction targets for the State of Maine, and Chapter 3-B, which authorizes Maine's participation in the Regional Greenhouse Gas Initiative (RGGI), fall within the MPUC's consideration of state renewable energy goals because, when taken together, those statutes address various renewable energy-related goals, including supply diversity and reliability, and GHG emission reductions. MPUC Order at 23.

reductions in overall GHG emissions through corresponding reductions of fossil fuel generation (primarily natural gas) in the region."[6] The MPUC further concluded that because it found that the NECEC will result in incremental hydroelectric generation, it follows that the Project will also provide GHG emissions reduction benefits in the region in the range of approximately 3.0 to 3.6 million metric tons per year.[7]

1.2 Discharge of Dredged / Fill Materials

1.2.1 Block 20: Reason for Discharge

The construction of the Project and modifications to existing facilities are not water dependent. However, the Project must unavoidably traverse streams and wetlands to connect to the proposed and existing substation facilities. The construction of the Project will unavoidably result in permanent and temporary wetland fill. Permanent wetland fill will be required for the placement of transmission line structures and the development of new substation facilities where wetlands cannot otherwise be avoided. Temporary wetland fill, which will be removed prior to the completion of the Project, will result from the establishment of access road and structure preparation areas (crane work pads), travel lanes for vegetation clearing, conductor puller and tensioner locations, guard structures, and guy anchors. In addition, forest in wetlands, riparian areas, and vernal pool habitat will be converted to scrub-shrub or emergent vegetation as required to adhere to conductor clearance specifications for overhead transmission lines.

1.2.2 Block 21: Type(s) of Materials Being Discharged and the Amount of Each Type in Cubic Yards

The types of materials being discharged include:

- Swamp (crane) mats for temporary access to areas required for vegetation clearing, transmission structure work pads, and puller-tensioner sites.
- Transmission line structures installed through direct embedment or supported on concrete foundations.
- Soil, gravel, trap rock, and concrete required as backfill at structure locations and foundations for transmission structures and substation development.
- Replacement culverts (steel, high-density polyethylene ("HDPE") or concrete) used to replace improperly installed or non-functioning culverts within CMP's right-of-way ("ROW") to enhance habitat and improve connectivity for cold water fisheries.

[6] CPCN Order at 71.
[7] CPCN Order at 72.

Table 1-1: Estimated Quantities of Discharge/Fill Materials

Project Activity	**Estimated Volume of Temporary Discharge (cubic yards)**	**Estimated Volume of Permanent Discharge (cubic yards**
Access across wetlands and streams (includes structure preparation and staging areas)[1]	140,922	10,525
Transmission Structures[2]	0	12,306
Substation & Converter Station Development	0	730

Notes:

1.) Depth of material was estimated at 1 foot for the purpose of calculating cubic yards of temporary fill
2.) Depth of material was estimated at 3 foot for the purpose of calculating cubic yards of discharged materials for transmission structures

1.2.3 Block 22: Surface Area in Acres of Wetland or Other Waters Filled

Table 1-2: Surface Area in Acres of Wetlands or Other Waters Filled

Resource Type and Impact	**Acres**
Temporary Wetland Fill	47.687 acres
Permanent Wetland Fill[8]	4.121 acres
Permanent Wetland Fill in Significant Vernal Pool Habitat (“SVPH”)	0.743 acre
Permanent Wetland Fill in USACE Jurisdictional Vernal Pools (Depression or 100 foot envelope).	2.218 acres
Permanent Wetland Fill in Inland Wading Bird and Waterfowl Habitat (“IWWH”)	0.003 acre

[8] Excludes permanent wetland fill in SVPH, USACE Jurisdictional Vernal Pools, and IWWH.

1.2.4 Block 23: Description of Avoidance, Minimization, and Compensation

The Project has been designed to avoid and minimize adverse impacts to waters of the United States ("U.S."). Specifically, the Project maximizes the use of existing ROWs and locates Project infrastructure in uplands wherever practicable. CMP proposes compensatory mitigation for impacts that cannot be avoided and/or have already been minimized. Please refer to Section 7.0 for avoidance and minimization measures and Section 9.0 for compensation for unavoidable impacts.

1.2.5 Block 24: Is Any of the Work Already Complete?

No.

1.2.6 Block 25: Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody

See abutter list in Attachment C.

1.2.7 Block 26: List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

The Project has received a CPCN from the MUPC. (See Attachment D.)

Applications have been submitted to the U.S. Department of Energy ("DOE") for a Presidential Permit; the MDEP for Site Law and NRPA permits and a request for a Section 401 Water Quality Certification; and the Maine Land Use Planning Commission ("LUPC") for land use certification. CMP will also submit an application to the International Boundary Commission requesting a joint letter of authorization for the border crossing. To date, no permits have been approved or denied by these agencies. Permit applications to municipalities requiring permits have not yet been submitted.

2.0 DEVELOPMENT DESCRIPTION

The NECEC consists of a HVDC electric transmission line from the Québec-Maine border to the point of first interconnection with the New England Transmission System at CMP's existing Larrabee Road Substation in Lewiston, Maine and related facilities and modifications to existing facilities. The new facilities and modifications to existing facilities are further described below.

Segments 1, 2, & 3 – HVDC Components and Associated Upgrades

- New 145.3-mile +/-320kV HVDC transmission line from the Canadian border to a new converter station located north of Merrill Road in Lewiston, with 53.5 miles of the 145.3 miles in a new corridor from the Canadian border to The Forks Plantation (Segment 1). The HVDC transmission line will also pass beneath the Kennebec River via a horizontal directional drill ("HDD"), which will require two termination stations on either side of the river in Moxie Gore and West Forks, as discussed further in Section 2.2.3);
- New 1.2-mile 345kV to +/-320kV transmission line from the new Merrill Road Converter Station to the existing Larrabee Road Substation;
- Partial rebuild of 0.8 mile of 34.5kV Section 72 AC transmission line outside of the Larrabee Road Substation to make room in the corridor for the 1.2-mile, 345kV Transmission Line;
- New 345kV transmission line to +/-320kV HVDC 1200MW Merrill Road Converter Station;
- Addition of 345kV transmission line terminal at the existing Larrabee Road Substation.

Segment 4 – 345kV STATCOM Substation and 115kV Rebuilds

- New 345kV +/-200MVAR STATCOM Fickett Road Substation;
- New 0.3-mile 345kV AC transmission line from the existing Surowiec Substation in Pownal to the new STATCOM Substation on Fickett Road in Pownal;
- Rebuild 16.1 miles of 115kV Section 64 AC transmission line from the existing Larrabee Road Substation to the existing Surowiec Substation;
- Rebuild 9.3 miles of 115kV Section 62 AC transmission line from the existing Crowley's Substation in Lewiston to the existing Surowiec Substation.

Segment 5 – New 345kV Transmission Line and Associated Rebuilds

- New 26.5-mile 345kV AC transmission line from the existing Coopers Mills Substation in Windsor to the existing Maine Yankee Substation in Wiscasset;
- Partial rebuild of 0.3 mile of 345kV Section 3025 between Larrabee Road Substation and

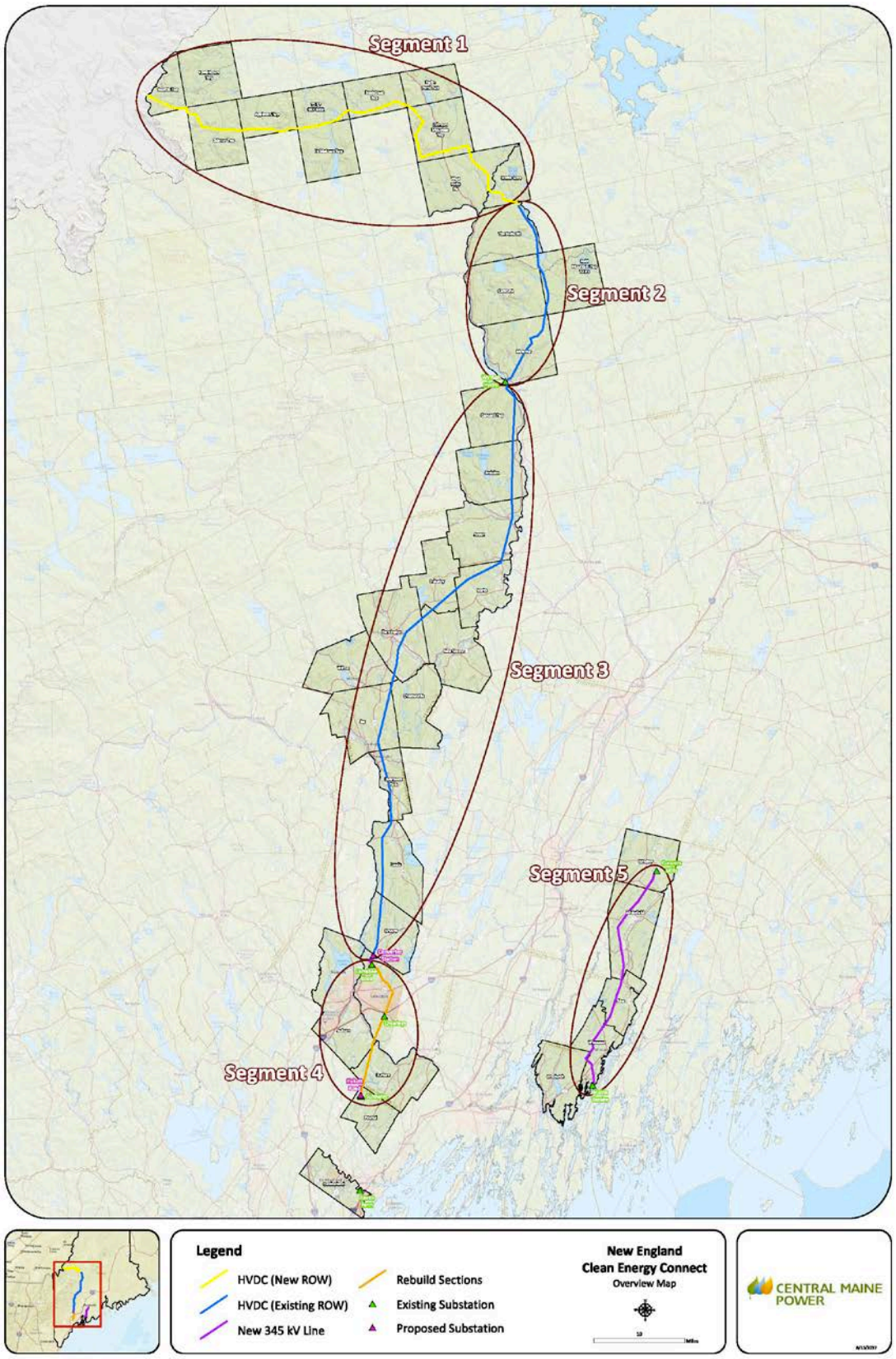
Coopers Mills Substation;

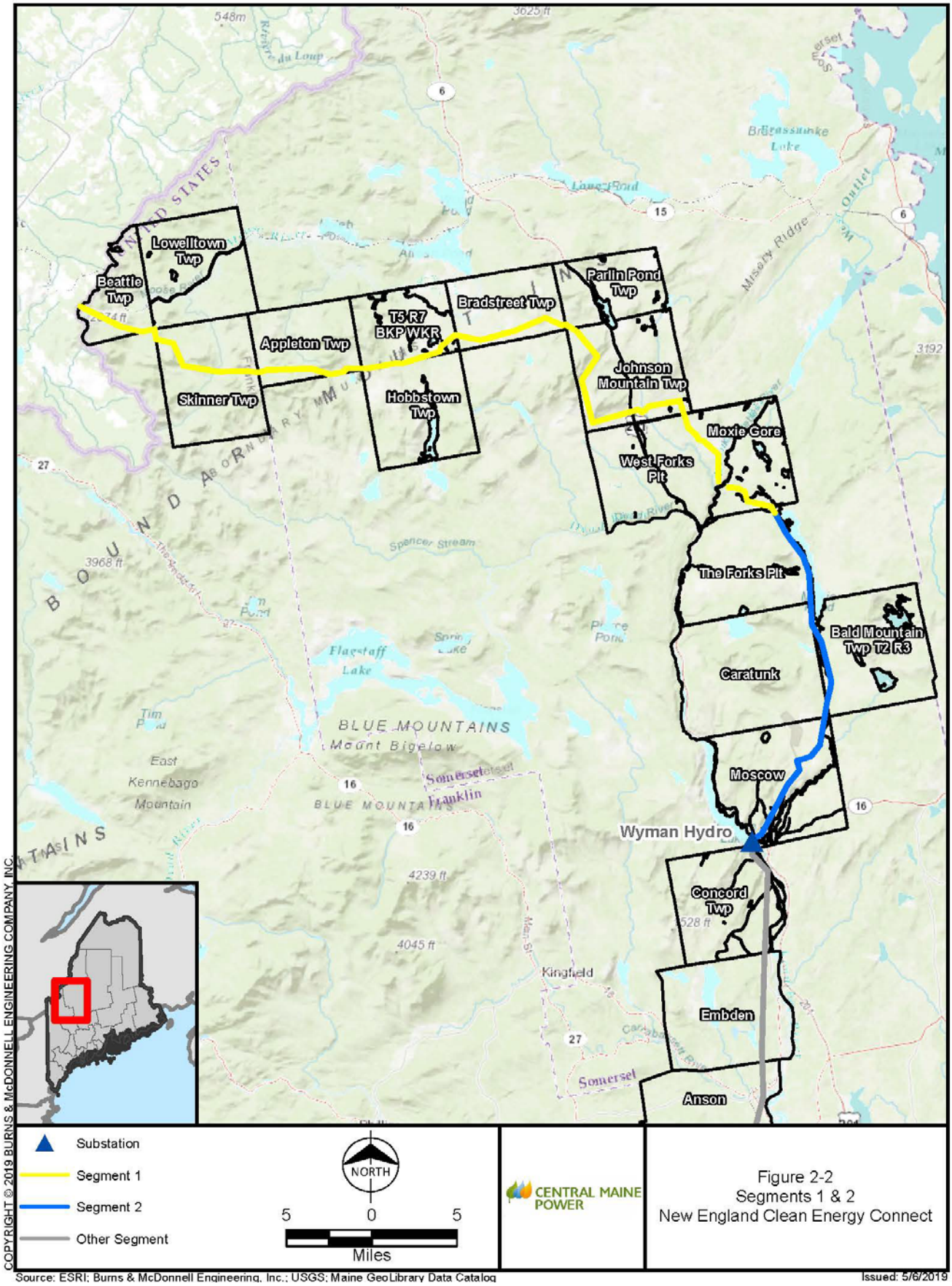
- Partial rebuild of 0.8 mile of 345kV Section 392 between Maine Yankee Substation and Coopers Mills Substation; and
- Partial rebuild of 0.8 mile each of 115kV Section 60/88 outside of Coopers Mills Substation.

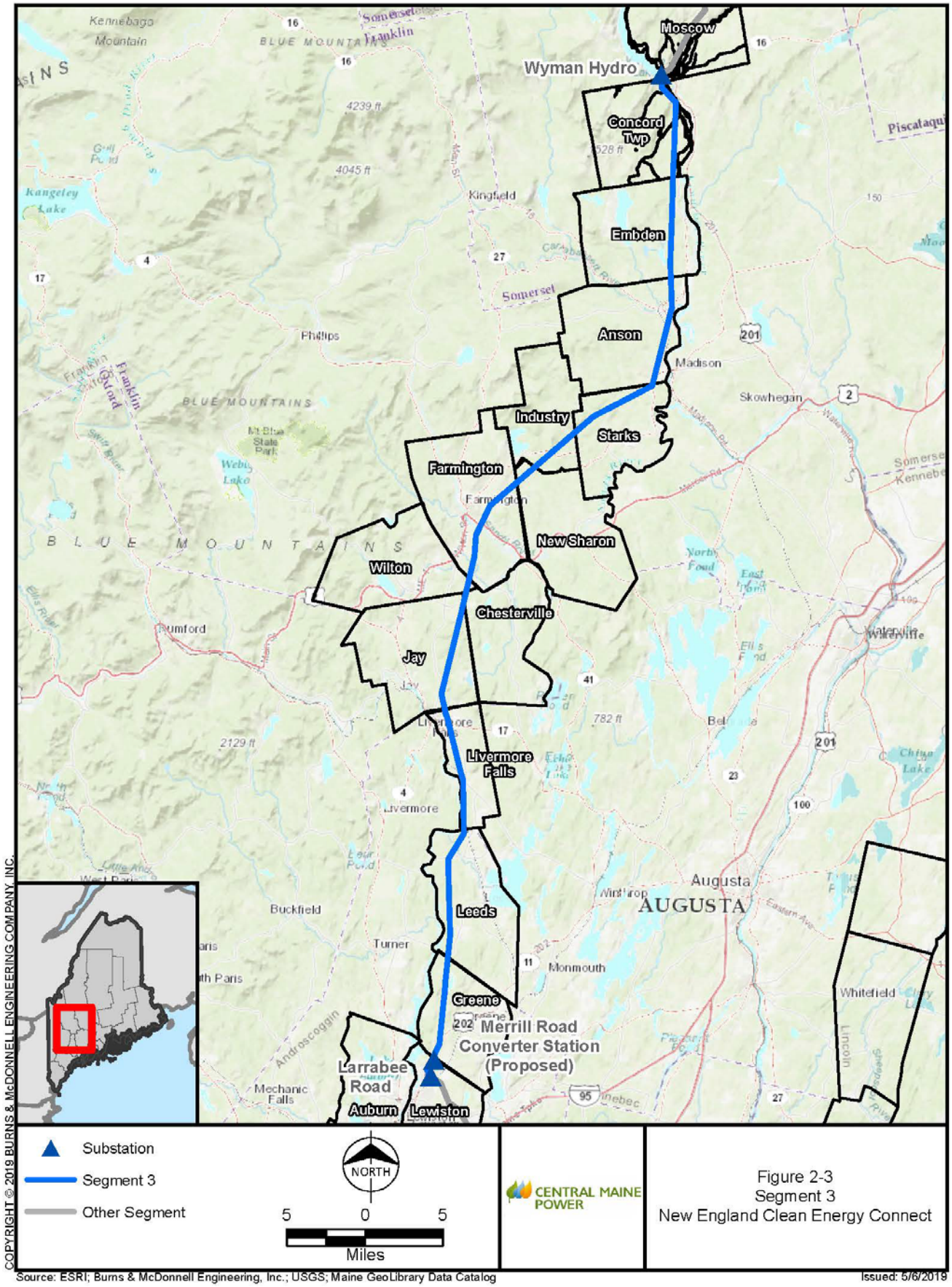
Additional equipment installation and upgrades will be required at Larrabee Road Substation (Lewiston), Crowley's Substation (Lewiston), Surowiec Substation (Pownal), Raven Farm Substation (Cumberland), Coopers Mills Substation (Windsor), and Maine Yankee Substation (Wiscasset), as detailed in Section 2.2.

Project maps, dividing the Project into segments for ease of reference, are provided in Figures 2-1 through 2-4. Table 2-1, below, provides specific attributes by Project segment. Additionally, Section 4.0 provides the Description of General Environmental setting by Project segment.

Figure 2-1: Project Overview Map




Lowelltown Twp
Beattie Twp
Appleton Twp
T5 R7 BKP WKR
Bradstreet Twp
Parlin Pond Twp
Skinner Twp
Hobbstown Twp
Johnson Mountain Twp
Moxie Gore
West Forks Plt
The Forks Plt
Bald Mountain Twp T2 R3
Caratunk
Moscow
Wyman Hydro
Concord Twp
Embden
Anson
BLUE MOUNTAINS
Mount Bigelow
Flagstaff Lake
East Kennebago Mountain
Kingfield
Substation
Segment 1
Segment 2
Other Segment
NORTH
5 0 5
Miles
CENTRAL MAINE POWER
Figure 2-2
Segments 1 & 2
New England Clean Energy Connect
Source: ESRI; Burns & McDonnell Engineering, Inc.; USGS; Maine GeoLibrary Data Catalog
Issued: 5/6/2019
COPYRIGHT © 2019 BURNS & McDONNELL ENGINEERING COMPANY, INC.


Moscow
Wyman Hydro
Concord Twp
Embden
Anson
Industry
Starks
Farmington
New Sharon
Wilton
Chesterville
Jay
Livermore Falls
Leeds
Greene
Merrill Road Converter Station (Proposed)
Larrabee Road
Auburn
Lewiston
Augusta
AUGUSTA
Substation
Segment 3
Other Segment
NORTH
5 0 5
Miles
CENTRAL MAINE POWER
Figure 2-3
Segment 3
New England Clean Energy Connect
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Source: ESRI; Burns & McDonnell Engineering, Inc.; USGS; Maine GeoLibrary Data Catalog
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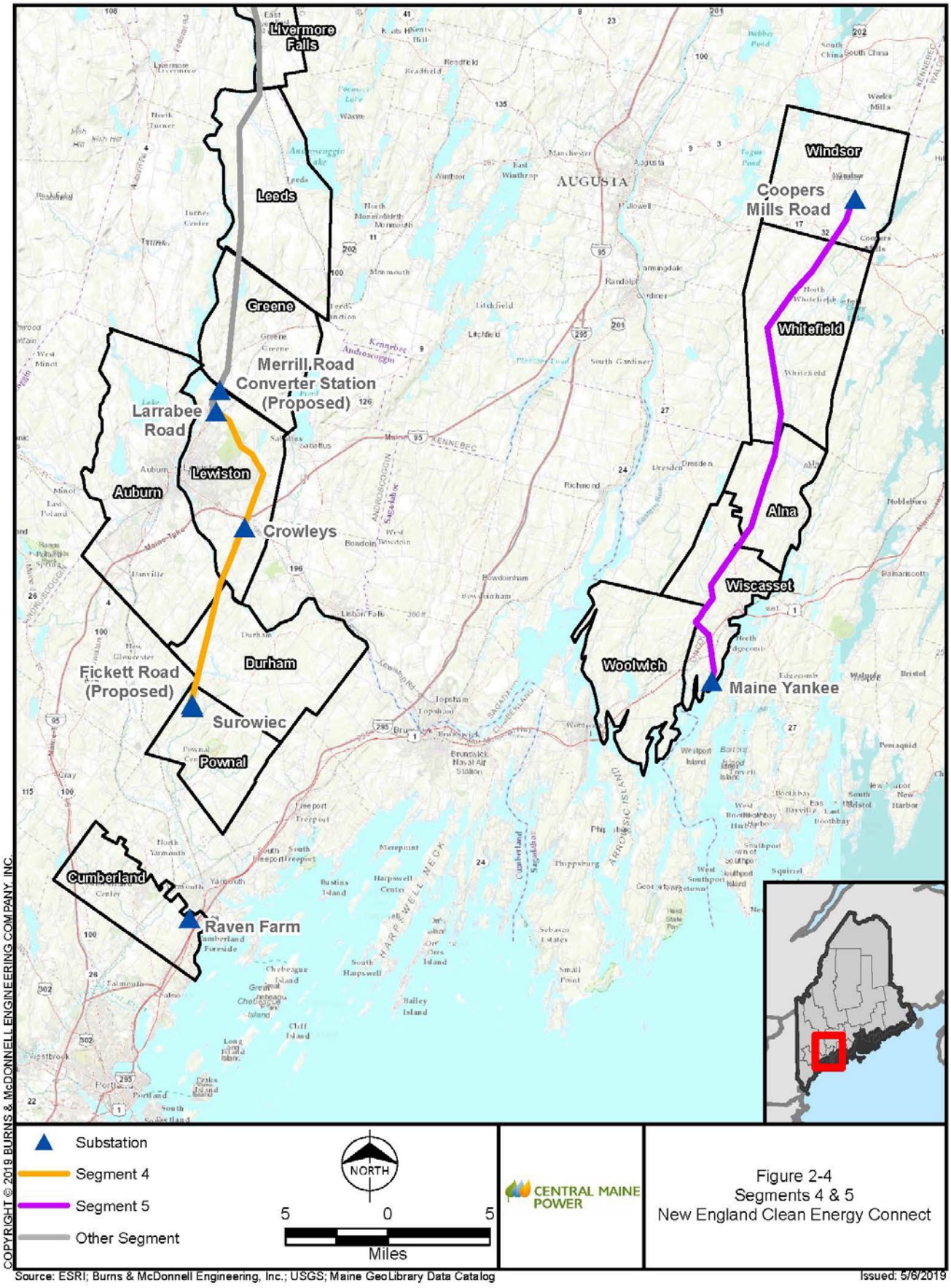


Figure 2-4
Segments 4 & 5
New England Clean Energy Connect

Source: ESRI; Burns & McDonnell Engineering, Inc.; USGS; Maine GeoLibrary Data Catalog

Issued: 5/6/2019

2.1 Transmission Lines

The proposed NECEC transmission line components include two basic forms: building new lines and rebuilding existing lines. The Project will include a total of approximately 201.1 miles of new or rebuilt transmission lines constructed within approximately 193 miles of transmission line corridor. Of this, approximately 139.5 miles is within existing corridor, and approximately 53.5 miles is within new corridor.

New transmission lines will be built in locations where existing transmission line infrastructure does not exist or was determined to be inadequate to meet the needs of the proposed electrical load. The new transmission line equipment includes approximately 145.3 miles of new HVDC line and 28 miles of new 345kV line. The transmission line components of the Project will consist of construction in approximately 27% in new corridor; 50% co-located in existing corridor requiring widening; and 23% of existing corridor with no widening required.

Rebuilding existing lines may be required for one or more reasons including the need to: (i) replace structures that are approaching the end of their service life, (ii) increase a line's capacity, (iii) reconfigure to create additional space within an existing corridor, or (iv) limit electrical outages. In some cases, the rebuild will consist of relocating a transmission line section by building a new line at a different location within the same existing corridor. In doing so, adequate space is then created to fit an additional transmission line in the same corridor without the need for corridor expansion. The relocated line may be rebuilt in a different configuration: for example, an H-frame double pole structure may be replaced with a single pole structure. All rebuilds will be operated at the same voltage as the original lines. Approximately 0.8 mile of 34.5kV, 26.2 miles of 115kV, and 1.1 miles of 345kV transmission line will be rebuilt as part of NECEC, all within existing corridors.

The new and rebuilt transmission lines will result in new configurations of lines within the CMP transmission line corridors. Figures depicting the existing and the proposed new configurations within the transmission line corridors can be found in Attachment A.

The transmission line infrastructure improvements described below are also presented in Table 2-1.

2.1.1 Section 3006: +/- 320kV High Voltage Direct Current Transmission Line

A new 145.3-mile HVDC transmission line, "Section 3006," located in Segments 1, 2, and 3 of the Project, will be constructed from Beattie Township on the Canadian border to a new converter station

north of Merrill Road in Lewiston. A portion of Section 3006, from Beattie Township to The Forks Plantation (approximately 53.5 miles), will be located within a 150-foot wide cleared ROW in a previously undeveloped, 300-foot-wide transmission line corridor. Section 3006 crosses one fragile mountain area (i.e. greater than 2700 feet in elevation), Coburn Mountain, in Johnson Mountain Township. From The Forks Plantation to Wyman Hydropower Station in Moscow, Section 3006 will be located within an existing, partially developed 300-foot-wide transmission line corridor (Section 222, approximately 21.9 miles). From Wyman Hydropower Station in Moscow to a new DC to AC Converter station in Lewiston, Section 3006 will be located within an existing, partially developed 400-foot-wide transmission line corridor (Sections 63, 278 and 200, approximately 71.5 miles).

Section 3006 will rely on a mix of direct embed and self-supporting tubular steel single and double pole structures.

2.1.1.1 Horizontal Directional Drill

CMP amended its Federal and State Applications on October 19, 2018 to include an HDD crossing beneath the Upper Kennebec River, between West Forks Plantation and Moxie Gore.

HDD is an underground utilities installation method which uses a drill rig to bore along an engineered alignment under and/or around various obstacles, such as a river crossing. HDD installation requires some temporary trenching in the transmission line segment between where the conductors exit the ground and where they come up into their respective termination stations. The crossing location of the Upper Kennebec River, designated as an Outstanding River Segment (38 M.R.S. § 480-P, referencing 12 M.R.S. § 403(7)), is a recreational resource used by whitewater rafters and anglers that provides regional and local economic benefit to Maine. This underground transmission line solution will fully preserve the scenic character of this section of the Kennebec River by eliminating the visibility and associated visual impacts of an overhead transmission line crossing and transmission line structures from recreational users of the river.

The HDD bore will travel underground approximately 3,000 feet from the Moxie Gore Termination Station on the east side of the Kennebec River to the West Forks Termination Station on the west side of the river. Five HVDC electrical conductors will be installed within a 36-inch steel conduit, through a 48-inch bore hole. The depth of the HDD bore beneath the riverbed will range from approximately 55 to 75 feet.

2.1.2 Section 3007: 345kV Transmission Line

A new, approximately 1.2-mile 345kV transmission line, “Section 3007,” located in Segment 3 of the Project, within an existing, partially developed 400-foot wide transmission line corridor (Section 200), will be constructed to connect the Merrill Road Converter Station to the existing Larrabee Road Substation. The conductor will be supported primarily by wood frame structures in a two pole H-frame configuration. Based on final detailed design requirements, CMP also may use steel, round wood, and/or laminated wood structures that may be direct embedded or self-supporting on foundations.

2.1.3 Section 72: 34.5kV Transmission Line Rebuild

Approximately 0.8 mile of the existing 34.5kV, “Section 72,” transmission line, located in Segment 3 of the Project, will be rebuilt just outside of the existing Larrabee Road Substation. This rebuild will provide space in the corridor to allow for the new 345kV Section 3007 line between the Merrill Road Converter Station and Larrabee Road Substation. The conductor will be supported primarily by wood pole structures in a monopole configuration.

2.1.4 Section 3005: 345kV Transmission Line

A new, approximately 0.3-mile 345kV transmission line, “Section 3005,” located in Segment 4 of the Project, partially within existing corridor, will be constructed to connect Fickett Road Substation to Surowiec Substation.

2.1.5 Section 62 and Section 64: 115 kV Transmission Line Rebuilds

Approximately 16.1 miles of the existing “Section 64” 115kV transmission line, located in Segment 4 of the Project, will be rebuilt between Larrabee Road Substation in Lewiston and Surowiec Substation in Pownal, and approximately 9.3 miles of the existing Section 62 115kV transmission line will be rebuilt between Crowley’s Substation in Lewiston and Surowiec Substation in Pownal. For both Sections, the conductor will be supported primarily by wood framed structures in a single pole configuration. Based on the final detailed design requirements, CMP also may use steel, round wood, and/or laminated wood structures that may be direct embedded or self-supporting on foundations. As part of these rebuilds, the existing H-frame structures will be replaced with single pole structures to maximize available space within the corridor.

2.1.6 Section 3027: 345kV Transmission Line

A new, approximately 26.5 mile 345kV transmission line, “Section 3027,” located in Segment 5 of the Project, will be constructed within the existing 270-foot-wide transmission line corridor from Coopers Mills Substation in Windsor to Maine Yankee Substation in Wiscasset.

2.1.7 Section 3025: 345kV Transmission Line Rebuild

Approximately 0.3 mile of the existing “Section 3025” transmission line, located in Segment 5 of the Project, will be partially rebuilt, just outside of the existing Coopers Mills Substation. This rebuild will clear space in the corridor to allow for the new 345kV Section 3027 line between Maine Yankee Substation and Coopers Mills Substation. The conductor will be supported primary by wood pole structures in an H-frame.

2.1.8 Section 392: 345kV Transmission Line Rebuild

Approximately 0.8 mile of the existing “Section 392” transmission line, located in Segment 5 of the Project will be partially rebuilt, just outside of the existing Coopers Mills Substation. This rebuild will clear space in the corridor to allow for the new 345kV Section 3027 line between Maine Yankee Substation and Coopers Mills Substation. The conductor will be supported primary by wood pole structures in a H-frame configuration.

2.1.9 Section 60 and Section 88: 115kV Transmission Line Rebuilds

Approximately 0.8 mile of both the existing “Sections 60” and “Section 88” transmission lines, located in Segment 5 of the Project, will be rebuilt (for a total of approximately 0.6 miles of rebuilt line), just outside of the existing Coopers Mills Substation. This rebuild will clear space in the corridor to allow for the new 345kV Section 3027 line between Maine Yankee Substation and Coopers Mills Substation. The conductor will be supported primary by wood pole structures in a monopole configuration.

Table 2-1: Transmission Line Infrastructure by Segment

Segment	Segment Length (miles)	Corridor Type	Municipality (ies)	CMP Section #	Voltage (kV)	New/ Rebuild	Prior/Current Permit #	Section Length (miles)	Description
1	53.5	New	Beattie Township, Lowelltown Township, Skinner Township, Appleton Township, T5 R7 BKP WKR, Hobbstown Township, Bradstreet Township, Parlin Pond Township, Johnston Mountain Township, West Forks Plantation, Moxie Gore, The Forks Plantation	3006	320kV	New	N/A	53.5	New HVDC Transmission Line within an undeveloped ROW from the Canadian Border in Beattie Township to an intersect with the existing Section 222 corridor in The Forks Plantation
2	21.9	Existing	The Forks Plantation, Caratunk, Bald Mtn Township T2 R3, Moscow	3006	320kV	New	N/A	21.9	New 21.9-mile +/- 320kV HVDC Transmission Line from the intersect with the Section 222 corridor to Wyman Hydro Substation in Moscow

Segment	Segment Length (miles)	Corridor Type	Municipality (ies)	CMP Section #	Voltage (kV)	New/ Rebuild	Prior/Current Permit #	Section Length (miles)	Description
3	71.1	Existing	Concord Township, Embden, Anson, Starks, Industry, Farmington, New Sharon, Chesterville, Wilton, Jay, Livermore Falls, Leeds, Greene, Lewiston	3006	320kV	New	N/A	69.9	New 69.9-mile +/- 320kV HVDC Transmission Line within an existing corridor from Wyman Hydro Substation in Moscow to the new Merrill Road Converter station in Lewiston
				3007	345kV	New	N/A	1.2	New 1.2-mile 345kV Transmission Line from the new Merrill Road Converter station to the existing Larrabee Road Substation
				72	34.5kV	Rebuild	N/A	0.8	Rebuild 0.8 mile of 34.5kV Section 72 AC Transmission Line outside of the Larrabee Road Substation to make room in the corridor for the 0.9 mile 345kV Transmission Line

Segment	Segment Length (miles)	Corridor Type	Municipality (ies)	CMP Section #	Voltage (kV)	New/ Rebuild	Prior/Current Permit #	Section Length (miles)	Description
4	16.4	Existing	Lewiston, Auburn, Durham, Pownal	62	115kV	Rebuild	N/A	9.3	Rebuild 9.3-mile 115kV Section 62 AC Transmission Line from the existing Crowley's Substation in Lewiston to the existing Surowiec Substation
				64	115kV	Rebuild	N/A	16.1	Rebuild 16.1-mile 115kV Section 64 AC Transmission Line from the existing Larrabee Road Substation to the existing Surowiec Substation
				3005	345kV	New	N/A	0.3	New 0.3-mile 345kV AC Transmission Line from the existing Surowiec Substation in Pownal to a new substation on Fickett Road in Pownal

Segment	Segment Length (miles)	Corridor Type	Municipality (ies)	CMP Section #	Voltage (kV)	New/ Rebuild	Prior/Current Permit #	Section Length (miles)	Description
5	26.5	Existing	Windsor, Whitefield, Alna, Wiscasset, Woolwich	3027	345kV	New	N/A	26.5	New 26.5-mile 345kV AC Transmission Line from the existing Coopers Mills Substation in Windsor to the existing Maine Yankee Substation in Wiscasset
				3025	345kV	Rebuild	MPRP # L-24620 A through E	0.3	Partial rebuild of 0.3 mile of 345kV Section 3025 near Coopers Mills Substation
				392	345kV	Rebuild	N/A	0.8	Partial rebuild of 0.8 mile of 345kV Section 392 near Coopers Mills Substation
				60/88	115kV	Rebuild	N/A	0.8	Rebuild 0.8 mile each of 115kV Section 60/88 outside of Coopers Mills Substation

N/A- Not applicable, no prior permit.

2.2 Substations

Substations are a necessary component of all electric transmission systems. Substations function as bulk power distribution centers with equipment and transmission lines interconnected, designed and configured to serve as the backbone of the electrical grid. Substations also contain the protective equipment required to ensure the transmission of electrical energy is safe and reliable. The substations of the NECEC are a combination of DC to AC conversion equipment; dynamic voltage support and reactive compensation equipment ("STATCOM"[9]); and switching and voltage step-down equipment arranged to interconnect the various transmission lines and reduce transmission voltage from 345kV to 115kV and/or from 115kV to 34.5kV.

The NECEC Project will involve the development of two new substations, two termination stations and the six existing substations will have equipment upgrades and installations not requiring yard expansions. The new facilities have been chosen to meet the identified electrical need while minimizing environmental impacts through site selection and equipment configuration.

The specific substation infrastructure improvements are presented in Table 2-2.

2.2.1 New Substation Facilities

2.2.1.1 Merrill Road Converter Station: 345kV to +/- 320kV HVDC 1200MW

A new DC to AC converter station is proposed north of Merrill Road in Lewiston, approximately 1.2 miles north of Larrabee Road Substation. The converter station will occupy approximately 10.71 acres on a site directly adjacent to an existing transmission line corridor.

2.2.1.2 Fickett Road Substation: 345kV +/-200 MVAR STATCOM

The proposed Fickett Road Substation will be located directly across Allen Road from the existing Surowiec Substation will occupy approximately 3.75 acres adjacent to Fickett Road in Pownal. Substation construction will include the installation of a 345kV +/-200MVAR STATCOM, the installation of three 345kV 100MVAR capacitor banks, and related bus and site work. This new substation will be in a field currently occupied by existing 345kV and 115kV transmission lines.

[9] A static synchronous compensator, also known as a "static synchronous condenser", is a regulating device used on alternating current electricity transmission networks.

2.2.2 Moxie Gore and West Forks Termination Stations

As part of the HDD to install the transmission line under the Upper Kennebec River, termination stations will be required on each side of the river to transition the transmission line from below ground to overhead. The Moxie Gore Termination Station (east side) and the West Forks Termination Station (west side) will be nearly identical in size and structure, each designed with a minimal footprint of 135 feet by 135 feet. The yards will be fenced and finished with a crushed stone surface, typical of CMP's substation yards. The yard will consist of electrical equipment and associated foundations (conduit riser, bus support, equipment support, transmission dead-end structures, etc.) arranged to perform the required functionality in a compact footprint. The termination stations will be passive and will contain no sound producing or light emitting equipment. Each termination station will have a gravel access road that will connect to existing logging roads.

The West Forks Termination Station will occupy approximately 0.77 acre. Approximately 2.48 acres will be disturbed during construction. The land disturbance will be required for the access road, termination station, and the temporary working platform/laydown for the HDD receiving site. Following construction, approximately 1.03 acres will remain as a permanently developed area and will contain the new termination yard, access road, and associated impervious areas (foundations and steel structures).

The Moxie Gore Termination Station will occupy approximately 0.72 acre. Approximately 2.30 acres will be disturbed during construction. The land disturbance will be required for the access road, termination station and the temporary working platform for the HDD drilling operations site. Following construction, approximately 1.44 acres of the disturbed area will be restored and revegetated. Approximately 0.86 acre will remain as a permanently developed area and will contain the new termination station yard, access road, and associated impervious areas (foundations and steel structures).

2.2.3 Substation Modifications and Upgrades

Modifications are proposed to the existing Coopers Mills Substation in Windsor, Crowley's Substation in Lewiston, Larrabee Road Substation in Lewiston, Maine Yankee Substation in Wiscasset, Surowiec Substation in Pownal, and Raven Farm Substation in Cumberland. With the exception of Raven Farm Substation, none of these modifications, detailed in the sections that follow, necessitates yard expansion.

2.2.3.1 Coopers Mills Substation

Modifications to the Coopers Mills Substation will include 345kV bus work and circuit breaker installations to reposition the existing Larrabee Road Substation and Maine Yankee Substation 345kV

transmission lines; the addition of a terminal for the new 345kV transmission line to Maine Yankee Substation; and the addition of a +/-200 MVAR STATCOM.

2.2.3.2 Crowley's Substation

Modifications to the Crowley's Substation will include the replacement of a 115kV switch and bus wire.

2.2.3.3 Larrabee Road Substation

Modifications to the Larrabee Road Substation will include a 345kV line terminal expansion, requiring the addition of a 345kV line termination structure, a 345kV circuit breaker, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations, modifications to the existing protection and control system, and network upgrades. The existing T1 transformer will be replaced with three single-phase autotransformers with a total nameplate rating of 600MVA (from 448MVA) to mitigate thermal overloads under contingency conditions.

2.2.3.4 Maine Yankee Substation

Modifications to the Maine Yankee Substation will include upgrading the existing 345kV bus arrangement to breaker and a half configuration through the addition of a 345kV three-circuit breaker bay, the relocation of the existing Coopers Mills 345kV line, the addition of a terminal for the new 345kV line from Coopers Mills Substation, and the repositioning of the existing 345kV line from Surowiec Substation.

2.2.3.5 Surowiec Substation

Modifications to the Surowiec Substation will include the addition of a terminal for the new 345kV transmission line from the proposed Fickett Road Substation, the addition of a new dead-end A-frame structure, and the addition of a new 345kV circuit breaker.

2.2.3.6 Raven Farm Substation

Modifications to the Raven Farm Substation will include the addition of a 345/115kV 448MVA autotransformer, associated buswork, and termination of the existing 115kV Sections 164, 164A, and 165 transmission lines at the substation. The fenced substation yard will be expanded to incorporate the area brought to subgrade as part of the Maine Power Reliability Program ("MPRP") project.

The specific substation infrastructure improvements are also presented in Table 2-2**.**

Table 2-2: Substation Infrastructure

NECEC SUBSTATIONS				
Substation	**Municipality**	**Voltage**	**Development Area**	**Prior/Current MDEP Permit #**
Equipment Upgrade: No Yard Expansion				
Coopers Mills	Windsor	345/115/34.5/12kV	0	MPRP # L-24620 A through E
Crowley's	Lewiston	115kV	0	N/A
Larrabee Road	Lewiston	345kV/115kV	0	MPRP # L-24620 A through E
Maine Yankee	Wiscasset	345kV	0	MPRP # L-24620 A through E
Surowiec	Pownal	345kV/115kV	0	MPRP # L-24620 A through E
Raven Farm	Cumberland	345kV/115kV	0	MPRP # L-24620 A through E
New Converter Station				
Merrill Road	Lewiston	1200MW	10.71 acres	N/A
New Substation				
Fickett Road	Pownal	345kV	3.75 acres	N/A
Termination Stations				
Moxie Gore	Moxie Gore	1200MW	0.77	N/A
West Forks	West Forks	1200MW	0.72	N/A

N/A- Not applicable, no prior permit

3.0 PUBLIC INTEREST REVIEW FACTORS

The NECEC will serve an important public need by providing transmission facilities capable of delivering up to 1,200 MW of electric generation from the Canadian border to the ISO-NE electric grid. The Project, proposed in response to the Massachusetts RFP, will supply Clean Energy Generation[10] from Québec to the New England Control Area[11] via an HVDC transmission line, at the lowest cost to ratepayers. The clean energy delivered by the Project will provide firm, guaranteed, and tracked year-round energy deliveries that will reduce winter electricity price spikes, improve system reliability and resiliency, and provide renewable energy certificates and other environmental attributes to help Massachusetts meet its GHG emissions reduction goals. CMP will not seek any cost recovery from Maine customers for the Project. Rather the Project will be paid for entirely by HRE, which is an affiliate of Hydro-Québec, and Massachusetts ratepayers in accordance with FERC-approved TSAs.

Further, in the May 3, 2019 Order granting the CPCN the MPUC concluded that the NECEC "will result in significant incremental hydroelectric generation from existing and new resources in Québec and, therefore, will result in reductions in overall GHG emissions through corresponding reductions of fossil fuel generation (primarily natural gas) in the region."[12] The MPUC further concluded that because it found that the NECEC will result in incremental hydroelectric generation, it follows that the Project will also provide GHG emissions reduction benefits in the region in the range of approximately 3.0 to 3.6 million metric tons per year.[13]

Overall, the localized and generally short-term and minor adverse impacts of the Project will be outweighed by the benefits that will accrue to the local and regional economies, as well as the long-term supply of Clean Energy to the New England as an instrumental factor in meeting regional GHG reduction goals.

The Project will be constructed, operated, and maintained in accordance with federal laws, executive orders, and policies. The Project will not adversely affect any federally-listed threatened or endangered species and will be consistent with the federal Clean Air Act regarding direct or indirect emissions of

[10] Under the terms of the RFP, "Clean Energy Generation" means either: (1) firm service hydroelectric generation from hydroelectric generation alone; (ii) new Massachusetts Class I RPS eligible resources that are firmed up with firm service hydroelectric generation; or (iii) new Massachusetts Class I RPS eligible resources.
[11] The New England Control Area includes the transmission system administered by ISO-New England, the regional transmission organization (RTO), located in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, but does not include the transmission system in northern Maine (i.e., Aroostook County and parts of Penobscot and Washington counties).
[12] CPCN Order at 71.
[13] CPCN Order at 72.

criteria pollutants. In addition, the Project will comply with the requirements of the National Historic Preservation Act ("NHPA") regarding the protection of significant cultural resource sites. The USACE has initiated NHPA Section 106 consultation and CMP continues to consult with the USACE and its consulting parties.

The Project is sited and designed to avoid or minimize impacts on environmental resources. CMP has also considered the factors set forth in 33 CFR 320.4 with respect to the USACE's Public Interest Review and those factors demonstrate that the Project is consistent with the public interest, as summarized below.

3.1 Conservation

The Project's compensatory mitigation program will result in the conservation, enhancement, and protection of habitat in the regions of the state where impacts will occur. The majority of the Project (73%) will be developed on lands already used for electric transmission purposes, and the remaining 27% will be developed in a region of the state where active timber harvesting occurs. Areas temporarily affected during Project development will be restored in the final phase of construction. Further, the long-term vegetation of the Project ROWs will conserve and expand scrub-shrub habitat.

In addition to the standard vegetation management, CMP has agreed to the following conservation measures for the protection of wildlife:

1. Retention of full height tree canopies at Gold Brook and Mountain Brook.
2. Establishment of deer winter travel corridors in the Upper Kennebec Deer Wintering Area ("DWA").
3. Retention of 10 to 15 foot tall spruce/fir trees in the Rusty blackbird habitat.

The following conservation lands are being proposed as compensation for Project impacts:

1. Three tracts of land, totaling 1,022 acres, to compensate for certain wetland impacts: Flagstaff Lake, Little Jimmie Pond-Harwood, and Pooler Pond.
2. Three tracts of land, totaling 1,053 acres, to compensate for forested conversion impacts to Outstanding River Segments and coldwater fisheries: Grand Falls, Lower Enchanted, and Basin.
3. Seven tracts of land, totaling 717 acres, located in the Upper Kennebec DWA.

Additionally, the Compensation Plan includes $3.07 million in lieu-fee and $2.08 million in contributions for other conservation and enhancement proposals. Please see the Compensation Plan for full details (Section 9.0).

3.2 Economics

As described above, the NECEC Project was proposed in response to the Massachusetts RFP and will supply Clean Energy Generation from Québec to the New England Control Area via an HVDC transmission line, at the lowest cost to ratepayers. CMP will not seek any cost recovery from Maine customers for the Project. Rather, the Project will be paid for entirely by HRE which is an affiliate of Hydro-Québec, and Massachusetts ratepayers in accordance with FERC-approved TSAs. Maine consumers will save $14 million to $44 million per year in wholesale market benefits. Additionally, a $140 million rate relief fund will be established, and a supplemental $50 million fund will help low-income customers.

The investment in this Project will contribute significantly to Maine's economy. According to an independent evaluation from the University of Southern Maine, NECEC will increase the state's Gross Domestic Product by $573 million. NECEC will invest $15 million in broadband infrastructure and expanded fiber optic capacity in host communities, thereby generating much needed economic development for western Maine. Maine's communities that host the Project will receive an estimated $18 million in increased property tax revenues each year, with the largest share going to communities in Androscoggin, Franklin, and Somerset counties.

The Project will create an average of more than 1,600 jobs during the construction phase, primarily in western Maine counties where jobs are needed. A $6 million educational fund will be established for vocational and training programs in Franklin and Somerset counties, as well as for scholarships and internships at University of Maine Farmington.

Also, on May 30, 2018, CMP signed a Memorandum of Understanding (MOU) with Western Mountains and Rivers Corporation (WM&RC), a Maine non-profit organization, that will provide significant economic development, tourism, and recreational opportunities. This MOU provides:

- Contribution of $250,000 to WM&RC to support its charitable mission, including funding WM&RC's initial start up expenses such as legal, accounting, consulting, staffing, travel and planning expenses.
- Contribution of $5,000,000 to support and enhance tourism and outdoor recreation in Central and Northern Somerset County, including construction, operation and staffing of a visitor center, maintenance of trails, and funding of education programs to improve the local tourism economy. WM&RC commits to leverage these grant funds to obtain funds from philanthropic donations, the local tourism bureau, local businesses and other sources to the maximum extent possible.

- Annual grants of $50,000 for 5 years (total $250,000) to be used for promotion of outdoor activities in Central and Northern Somerset County and the improvement of the trail and track network in the area.
- Donation of certain parcels of CMP-owned lands in Central and Northern Somerset County to be used for trails, huts, Kennebec River leases and other recreational infrastructure.
- Purchase options to Central and Northern Somerset County businesses that presently lease CMP land allowing these lands and available adjacent land to be used for business expansion.
- Availability of certain parcels of CMP-owned land in Central and Northern Somerset County for economic development-related purposes, including potentially an outfitting center, reservations services center, or a meeting space or classroom.
- Inclusion of fiber optic in the Project to provide broadband internet access to Somerset and Franklin counties.
- Access to CMP-owned gravel pits and use of gravel at no cost for development and maintenance of recreational assets.
- Public access to the transmission line corridor for ATV, snowmobile and other recreational uses.
- Access, through existing CMP easements or via CMP's purchase of the Indian Pond Road, to Harris Station, Indian Pond & Carry Brook for recreational uses.

3.3 Aesthetics

Visual impacts were fully assessed in a Visual Impact Assessment ("VIA"), supplemental visual materials in response to MDEP's Peer Reviewer Dr. James Palmer, responses to data requests by the agencies, and in testimony at the MDEP/LUPC Hearings,[14] following methodology and standards set forth by the MDEP. The NRPA and Chapter 315 require an applicant to demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic uses of a scenic resource and apply to activities in, on, over, or adjacent to a protected natural resource. More broadly, the Site Law and Chapter 375.14 require an applicant to demonstrate that the development will not have an unreasonable adverse effect on the scenic character of the surrounding area.

In order to assess such impacts to identified scenic resources, and other points of local sensitivity, the applicant submitted a VIA for the Project area prepared by Terrence J. DeWan & Associates ("TJD&A"). The VIA assessed each segment and substation where visible changes will occur using standard visual

[14] Site Law Application, Section 6.0 submitted to the USACE on 9/29/2017, Supplemental Information provided on 12/8/2017, 1/22/2018, 3/15/2018, 3/23/2018, 3/29/2018, 6/29/2018, 8/13/2018,10/19/2018, 12/8/2018, 12/9/2018, 1/9/2019, 1/16/2019, 1/28/2019, and 1/30/2019, Testimony provided by Segal and Dewan at the MDEP/LUPC Hearings held 4/1 to 4/5/2019 and 5/9/2019.

impact assessment methodologies, and following the methodology and standards described in NRPA Chapter 315 regulations and Site Law Chapter 375.14. TJD&A further reviewed and responded to the reports of the MDEP's peer reviewer, Dr. James Palmer, and worked with Dr. Palmer and the MDEP to their satisfaction with regard to their comments on the evaluation and reasonableness of visual impacts.

3.3.1 Transmission lines

New structures have been set back as far from streams, rivers, and other areas of visual/habitat sensitivity as practicable. There are many areas where favorable growing conditions and CMP's maintenance procedures have resulted in effective stands of non-capable species near the roadside, which act as visual buffers. Wherever practicable, existing vegetation will be preserved within the transmission line corridor by careful layout of access roads and monitoring of construction practices during the installation process.

In Segment 1, the primary mitigation measure being employed is to use self-weathering steel single poles to minimize visual contrast, especially when viewed from elevated viewpoints and where the structure is seen against a wooded backdrop. The new HVDC transmission line corridor is also primarily located in areas of commercial timber production that have been, and continue to be, periodically harvested. Due to a reduction of a pole height near Beattie Pond, the Project will not be visible from Beattie Pond. Non-specular conductors and tapering will be used at Rock Pond to reduce reflective qualities of the conductors and the visibility of the right of way tree clearing when viewed from the most visually sensitive locations. Tapering will also be used near Coburn Mountain to reduce Project visibility from the summit. At the upper Kennebec River crossing, the Project will be buried via HDD and neither the termination stations nor any associated transmission line infrastructure will be visible from the river.

In Segments 2 and 3, the primary mitigation measure being employed is to co-locate the HVDC transmission line within or adjacent to an existing corridor, rather than acquiring and developing an entirely new or separate transmission line corridor. This co-location strategy significantly reduces potential visual impacts. The HVDC structures will be made of self-weathering steel, which will result in minimal color contrast with the surrounding wooded landscape when viewed from elevated viewpoints and water bodies. Heights of the HVDC structures on the western side of Moxie Pond have been minimized to the extent possible to reduce the contrast in scale and reduce potential visibility from Moxie Pond. Where the widening of the cleared corridor results in a longer duration of exposure to AT hikers (east of Baker Stream), a planting plan has been proposed that will adequately buffer the Project from that use.

Segment 4 and 5 have been designed to minimize additional clearing and the need for land acquisition by making the most effective use of existing corridors, existing structures, and rebuilding existing transmission lines. The proposed single pole 115kV structures in Segment 4 will be made of wood, which will be similar to the existing structures and minimize contrast in color, line, form and texture. The proposed H-frame 345kV structures in Segment 5 will be made of wood, which will be similar to the existing structures and minimize contrast in color, line, form and texture.

3.3.2 Substations

CMP employed two main mitigation strategies in the development of plans for the new and improved substations to reduce their potential visual impact and achieve a harmonious balance between the facilities and the surrounding landscape. These include upgrading existing substations within the existing facility footprint, which minimizes the need for additional clearing. Also, a Buffer Planting Plan was developed for the areas north and east of the Fickett Road Substation in Pownal to minimize views of the substation. The Merrill Road Converter Station has been sited to avoid visibility from public roads. The existing topography and intervening vegetation around the station will screen it from view from Merrill Road. The two termination stations at the HDD crossing of the Upper Kennebec River will not be visible from any viewpoints, including the Kennebec River.

A. Merrill Road Converter Station. The primary mitigation strategy used to minimize potential visual impacts from the Merrill Road Converter Station include siting the facility in a wooded area that provides the opportunity to preserve a significant vegetative buffer on all sides of the Converter Station and where there is minimal potential for public viewpoints or roads. The only potential visual impacts will be to snowmobile users.
B. Fickett Road Substation. The proposed Fickett Road Substation has been sited within a landscape filled with electrical infrastructure in an area that requires minimal additional clearing and within a short distance from Surowiec Substation. Though there are no scenic resources impacted, the adjacent homes will have expanded views of the developed landscape. As part of NECEC, visual buffer plantings will be installed on the south side of Fickett Road to minimize adverse effects on the scenic character of the surrounding area. This additional buffer will also minimize views of the Surowiec Substation. Buffer plantings will take into consideration the need for proper setbacks, avoiding wetland impacts, limitations on planting within and adjacent to transmission line corridors, and visibility requirements for security around the proposed substation.
C. Surowiec Substation. The primary mitigation strategy used to minimize potential visual impacts for the expansion to the Surowiec Substation is to locate the proposed components within the

cleared/developed area north of the existing substation. No additional tree removal will be necessary.

D. Larrabee Road Substation. The primary mitigation strategy used at the Larrabee Road Substation is to site the NECEC Project within the existing substation facility. No additional tree removal will be required. Mitigation completed for the MPRP (buffer planting plan) has been installed and provides partial screening of the facility from the end of Larrabee Road. The Substation will not be visible from any public roads, with the exception of the end of Larrabee Road. Preserved vegetation surrounding the substation will screen the NECEC Project components from most public views.

E. Coopers Mills Substation. The primary mitigation strategy used at the Coopers Mills Substation is to site the NECEC Project within the existing substation facility. No additional tree removal will be required. Mitigation completed for MPRP (earth berms and preserved vegetation) have been implemented and provide partial screening of the facility from Coopers Mills Road.

F. Crowley's Substation. The primary mitigation strategy used at the Crowley's Substation is to upgrade within an existing substation. No additional tree removal will be required.

G. Maine Yankee Substation. The primary mitigation strategy being employed at the Maine Yankee Substation is to expand an existing substation adjacent to an existing transmission line within an existing industrial area.

H. Raven Farm Substation. The primary mitigation strategy used to minimize potential visual impacts for the expansion to the Raven Farm Substation is to locate the proposed components within the cleared/developed area west of the existing substation. No additional tree removal will be necessary. The existing planted earthen berm and buffer plantings will screen the majority of the expansion from Greely Road.

CMP has demonstrated that the proposed activity meets the standards for visual quality established under Chapter 315 and the Site Law's Chapter 375.14 (i.e., that the proposed activity will not unreasonably interfere with existing scenic and aesthetic uses, that the developer has made adequate provision for fitting the development harmoniously into the existing natural environment, and that the development will not adversely affect scenic character in the surrounding area).

3.4 General Environmental Concerns

By providing a cost-effective and environmentally friendly transmission path to deliver Québec-sourced Clean Energy Generation, the NECEC will reduce greenhouse gas emissions from fossil-fuel fired thermal generation in New England, enhance electric reliability (particularly during winter months when

natural gas supply constraints have occurred in recent years), and reduce the wholesale cost of electricity for the benefit of retail customers across the region. In the MPUC Order, the MPUC found "that the NECEC will result in incremental hydroelectric generation, [and] it follows that the Project will also provide GHG emissions reduction benefits in the region. As noted above, the expert analyses provided in the record in this proceeding indicates that the GHG emission reductions in the region resulting from the NECEC would be in the range of approximately 3.0 to 3.6 million metric tons per year, which as noted above, is equivalent to removing approximately 700,000 passenger vehicles from the road."[15]

These positive effects will outweigh the predominantly minor and localized impacts associated with the construction, operation, and maintenance of the Project. The principal long-term adverse impact will be the removal of forested vegetation (upland and wetland) and the maintenance of such previously-forested areas as scrub-shrub habitat for the useful life of the Project. Rather than a loss of habitat, this will result in conversion of habitat from one type to another type. The management of ROWs in an early successional condition will continue to support a variety of wildlife species and life stages.

Tree clearing may also result in some GHG impacts, however that impact has been minimized by maintaining vegetation to the greatest extent practicable, and these relatively minor impacts are far outweighed by the GHG emissions reduction benefits of bringing 9.45 terawatt hours ("TWh") of clean energy into the New England region.

Other temporary impacts will occur only during the construction phase. For example, all phases of the Project will generate noise. However, noise emissions will be temporary and intermittent; will occur primarily during daylight hours (when human sensitivity to noise is lower); and will be in conformance with applicable state and municipal noise limits and requirements. Similarly, the construction of the Project will result in air emissions from the operation of equipment and vehicles (particularly diesel exhaust from heavy equipment) and will cause fugitive dust as a result of construction equipment movements along access roads and at work sites. However, air emissions will be limited to the construction phase and will be highly localized in the vicinity of work areas. Best management practices will be implemented to minimize dust during construction. Equipment emissions will conform to applicable state requirements.

[15] MPUC Order at 71-72

3.5 Wetlands

As described in this Application, CMP has incorporated measures to avoid or minimize impacts to wetlands into the Project design and will continue efforts to minimize impacts during construction through best management practices ("BMPs") such as using construction mats to cross wetlands with heavy equipment. Compensatory mitigation will be used to offset impacts to wetlands that cannot be effectively avoided or minimized.

3.6 Historic Properties

In consultation with the Maine Historic Preservation Commission ("MHPC"), the applicant conducted cultural resource surveys on the Project area to identify significant historic sites within the Area of Potential Effect ("APE") along the proposed transmission line corridors and the new or expanded substations.

CMP submitted copies of all cultural resources reports to the MHPC as well as review comments received from the MHPC, to the USACE on June 14, 2019. CMP anticipates a meeting with the USACE, MHPC, Maine Appalachian Trail Club ("MATC"), Appalachian Trail Conservancy ("ATC") and National Park Service ("NPS") in July 2019 to discuss specific project avoidance measures and, where avoidance is not possible, a means to address potential adverse effects and, if appropriate, the development of a Memorandum of Agreement ("MOA") to the satisfaction of all consulting parties.

3.7 Fish and Wildlife Values

CMP continues to consult with the United States Fish and Wildlife Service ("USFWS") and has concluded consultation with the Maine Department of Inland Fisheries and Wildlife ("MDIFW"). CMP has prepared a draft Biological Assessment to assist the USACE with the Section 7 (Endangered Species Act or "ESA") consultation process. The USFWS will review the Biological Assessment and will make a finding with respect to the ESA. In general, due to the vegetative maintenance that is required to safely construct and operate transmission lines, the corridors that are created alter, but do not eliminate, habitat in areas where forest cover previously existed. Transmission line corridors are maintained as early-successional shrub and herbaceous-dominated habitat. Habitat conversion is most pronounced in those areas where the proposed transmission line corridor traverses mature forest stands. The NECEC has been sited and designed to minimize the creation of new transmission line corridors, e.g., approximately 73 percent of the Project will be located within existing corridors. Approximately 27 percent of the Project will require new corridor, however this region is already intensively managed for forest products and the creation of a transmission corridor is not likely to disrupt or significantly alter existing land uses. Along select segments, some conversion will be required to modestly

expand (by approximately 75 feet in width) existing transmission line corridors to accommodate additional transmission lines.

Habitat conversion along transmission line corridors results in a loss of habitat types which, in turn, may adversely impact species that are reliant on the original habitat types. Conversely, such alteration provides benefits to several species. Linear transmission line corridors provide beneficial connectivity between habitat patches in disturbed landscapes (Willyard et al. 2004). Vegetation on a maintained transmission line corridor can also provide important foraging opportunities for several species, in particular, more winter browse for ungulates is available on transmission line corridors than in adjacent forests (Manitoba Hydro 1995). Geier (1992) showed that small mammals, deer, and moose fed more often in transmission line corridors than in adjacent forests. Maintained transmission line corridors may also provide important habitat for some declining populations of pollinator species that rely on scrub-shrub habitats, such as bumble bees and butterflies (Confer 2000, Confer and Pascoe 2003).

The construction and vegetation management practices described in its BMPs (Attachment B) establish protections for stream buffers within the NECEC Project area. Stream buffers were expanded from CMP's initial proposal in September 2017. In a meeting held between CMP, DEP, and MDIFW on January 22, 2019, DEP and MDIFW recommended that for CMP to adequately protect fisheries, protections of riparian buffers for vegetation management and maintenance activities should be expanded to 100 feet for cold water fishery habitats, outstanding river segments, threatened or endangered species streams, and all perennial streams in the new corridor portion (Segment 1) of the Project. For all other water bodies, DEP and MDIFW recommended an expanded buffer of 75 feet. Based on this guidance, CMP subsequently incorporated these improvements into its BMPs.

In general, given the existing landscape characteristics of the overall NECEC Project area, construction and maintenance of the transmission line corridors will result in habitat conversion that is already common to the area, i.e. forested to scrub-shrub. It is anticipated that local wildlife populations will adapt and respond to any additional alterations much as they already do to uses within the vicinity of the transmission line corridor. Impacts of habitat conversion along the proposed transmission line corridor are expected to be minimal and beneficial to some species while detrimental to other species. CMP has developed a detailed Compensation Plan through consultation with state and federal resource and regulatory agencies to address impacts to wildlife and fisheries. This plan is located in Section 9.0.

3.8 Flood Hazards

The NECEC will cross a number of flood plains and engineering analysis are being completed to determine the final design impacts within floodplains. Because of the small footprint (averaging 40 square

feet for a typical pole) associated with each transmission line structure, construction and maintenance of the proposed transmission lines will not cause or increase flooding or cause an unreasonable flood hazard to any neighboring structures. The Surowiec Substation and the proposed Fickett Road Substation are partially located within FEMA-designated 100-year flood zones. The Coopers Mills Substation, Larrabee Road Substation, Maine Yankee Substation, and the proposed Merrill Road Converter Station are not located within a FEMA-designated 100-year flood zone.[16] The Merrill Road Converter Station and the Fickett Road Substation will be designed and constructed at a final elevation such that their equipment will not be inundated during a 100-year flood event. The Project is not anticipated to affect flood storage or increase flood hazards.

3.9 Floodplain Values

As noted in Section 3.8, for those structures proposed within floodplains and floodways, engineering assessments will determine whether there will be an impact to flood storage volume and whether engineering solutions will need to be considered.

3.10 Land Use

Land uses in the vicinity of the NECEC generally include forestry, agriculture, residential, commercial, industrial, transportation, recreation, conservation, historical, and natural features such as rivers, lakes, wetlands, and wildlife habitat areas. These uses will continue uninterrupted during the construction, operation, and maintenance of the transmission lines and the associated facilities.

3.11 Navigation

The Project will not affect any portion of a waterbody considered to be navigable waters of the United States.

3.12 Shore Erosion and Accretion

The Project is not located within the coastal zone and will not affect any beach areas.

3.13 Recreation

The NECEC Project crosses lands that provide recreational values to the local communities and throughout the region. The Project has been sited and designed such that it creates no interference with the recreational and navigational uses of the surrounding area. CMP's existing transmission line corridors are widely utilized year-round for private and commercial recreational activities including hunting,

[16] As determined by FIRM and FEMA data.

fishing, foraging, hiking (including on the AT where it crosses the existing transmission line corridor), biking, skiing, snowmobiling, birding, and boating.

For example, the co-location of new transmission line within a CMP-owned corridor crossed by the AT is consistent with the existing use and with hikers' expectation of crossing a transmission line corridor in that location. Further, when the NPS acquired by easement the portions of the trail that cross CMP's existing transmission line corridor, it anticipated and agreed to the construction of additional above ground electric transmission lines, and related clearing. This agreement establishes that the addition of overhead transmission lines at the AT in that location would not unreasonably interfere with uses of that trail.

Furthermore, because recreational users of Segment 1 are "well accustomed to the sights, sounds, and smells of active forest management on an industrial scale," similar impacts from a new transmission line corridor will in no way affect recreational uses. Rafters along Maine's waterways, including the upper Kennebec and Penobscot Rivers usually begin their trips close to hydro facilities that include Harris Station along the Kennebec River, as well as McKay Station along the Penobscot River. Those rafting, fishing, or boating downstream of McKay Station, are accustomed to not only seeing the large hydro-electric facilities, but also transmission lines that run in close proximity to, and even cross, the Penobscot River. These users are generally appreciative of the benefit offered by hydro-electric dams and their controlled water releases, transmission lines, and related electricity infrastructure, and understand that transmission lines and related infrastructure have no impact on recreational fishing opportunities.

3.14 Water Supply and Conservation

None of the NECEC Project's transmission lines will require water supply facilities. There are no individual wells proposed for the new Merrill Road Converter Station or the new Fickett Road Substation. The Coopers Mills, Larrabee Road, Raven Farm, and Surowiec substations have existing wells, and no modifications to the wells at those locations are needed. The existing water supply at each facility will be used, and all are sufficient to meet anticipated future needs. There are no water supply facilities associated with Crowley's Substation or Maine Yankee Substation, and none is proposed. No common wells or public water supply wells are proposed at any of the NECEC Project substations.

3.15 Water Quality

Potential sources of water quality degradation differ during the construction, maintenance, and operation phases of transmission line and substation facilities, but CMP has proposed adequate measures to minimize these potential threats as set forth in the following CMP BMPs, located in Attachment E.

- Exhibit E-1: CMP's Environmental Control Requirements for CMP Contractors and Subcontractors ("Environmental Control Requirements")
- Exhibit E-2: CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects ("Environmental Guidelines")
- Exhibit E-3: NECEC Plan for Protection of Sensitive Natural Resources During Initial Vegetation Clearing ("VCP")
- Exhibit E-4: NECEC Post-Construction Vegetation Maintenance Plan ("VMP")
- Exhibit E-5: NECEC Project Construction Dewatering Plan

3.16 Energy Needs

The clean energy delivered by the Project will provide firm, guaranteed, and tracked year-round energy deliveries that will reduce winter electricity price spikes, improve system reliability and resiliency, and provide renewable energy certificates and other environmental attributes to help Massachusetts meet its GHG emission reduction goals. On May 3, 2019, the Project received a CPCN from the MPUC, confirming the public need for the energy that the NECEC will supply.

3.17 Safety

The Project will be constructed, operated, and maintained to meet or exceed all applicable safety standards established by the electrical transmission industry, regulators, and the companies.

3.18 Food and Fiber Production

The Project will not result in long-term adverse impacts to agricultural areas and thus to the production of food or fiber resources. In a few locations where the ROW extends across active agricultural lands, these areas will be restored post-construction to pre-construction productivity levels.

3.19 Mineral Needs

The construction of the Project will involve the use of various mineral resources (e.g. sand, gravel, etc.). CMP will source these materials from local and regional suppliers.

3.20 Consideration of Property Ownership

The applicant demonstrated title, right, or interest ("TRI") in the properties proposed for development or use by submitting copies of deeds and easements to the USACE in September 2017. A list of Real Property Rights is included as Exhibit F-1 in Attachment F. Additionally, in January 2019, CMP submitted maps to the MDEP, depicting and identifying the parcels on or over which the Project is proposed to be located and for which CMP has documented TRI.[17] These maps are included as Exhibit F-2 in Attachment F. CMP has demonstrated sufficient TRI in all of the properties that are proposed for development.

3.21 Needs and Welfare of the People

As described in the Project's Purpose (Section 1.1.5), the general public and regional commerce will benefit from the supply of clean energy and the reduction of GHG.

Also, as noted in Section 3.2 of this Application, this Project will contribute significantly to Maine's economy and, in so doing, will help meet the needs and welfare of Maine residents, in several ways. The NECEC Project will: increase the state's Gross Domestic Product by $573 million; include investment of $15 million in broadband infrastructure and expanded fiber optic capacity in host communities; generate an estimated $18 million in increased property tax revenues each year for host communities; create an average of more than 1,600 jobs during the construction phase; and include establishment of a $6 million educational fund for vocational and training programs in Franklin and Somerset counties and for scholarships and internships at University of Maine Farmington.

Additionally, as detailed above in Section 3.2, on May 30, 2018, CMP signed a MOU with WM&RC, a Maine non-profit organization, that will provide significant economic development, tourism, and recreational opportunities, which will meet the needs and enhance the welfare of people in the region.

[17] CMP letter to MDEP 1/25/2019.

4.0 DESCRIPTION OF GENERAL ENVIRONMENTAL SETTING

4.1 Topography and Geology

The Project area has been shaped by the advance and retreat of glaciers. During the most recent ice age, a continuous glacier covered all of Maine and south to southern New England, thus the Project area is covered mostly by ground moraine, which is undulating and littered with boulders. Kettle ponds and other water bodies are common. The highest elevations in the Project area are in the northern third of the HVDC transmission line, which is located in the Blue Mountains.

The northern portion of the HVDC transmission line is comprised of primarily Devonian-age volcanic and plutonic mountains. The southern portion of the HVDC transmission line is comprised of rolling ground moraine overlying highly metamorphosed sedimentary rocks located in what is known as the Central Maine slate belt.

The Project will require surficial excavation and grading (for substation and converter sites) during construction. The transmission line and substation components will be sited and designed to best conform to existing topographic features. Once construction is complete, areas that were excavated or graded for construction will be restored to pre-construction conditions. Conductor pull pad locations may require grading if they are not already level, and some equipment laydown areas and access paths may require leveling as well. These areas will also be restored to pre-construction conditions after construction is complete.

During construction of transmission lines and substations associated with the NECEC Project, it is likely that occasional shallow-to-bedrock soil depths and subsurface boulders will be encountered. Blasting may be required in order to install transmission line support structures, or for substation construction in these areas. For transmission line construction, blasting activity will be limited to the small volume of material needed to be removed to fit and plumb pole structures.

4.2 Soils

4.2.1 Introduction

CMP has completed an analysis of soils within the NECEC Project's transmission line corridor and related substation facilities locations. The Soil Survey Geographic Database ("SSURGO") compiled by the United States Department of Agriculture – Natural Resources Conservation Service ("USDA-NRCS"), hardcopies of published USDA-NRCS county soil surveys, and the Official Series Description ("OSD") website of the USDA-NRCS were utilized as the basis for the soils analysis along the NECEC

transmission line corridor. To identify and map soils, Geographic Information Systems ("GIS") software was used to complete an overlay analysis of the georeferenced SSURGO data and the area of the transmission line corridor. Characteristics of the USDA-NRCS mapped soils were analyzed; summary descriptions of all soils identified along the NECEC corridor are provided in Section 4.2.2. Soils for transmission line and substation components are identified in Section 4.2.3 and Section 4.2.4.

Given that this analysis is based on existing NRCS SSURGO mapping, some mapped series are classified as having a mesic temperature regime. The mesic temperature regime of Soil Taxonomy is no longer applied to soils in Maine, and soils previously mapped with a mesic temperature regime are now correlated to series with a frigid temperature regime. However, given that existing SSURGO mapping was used as the basis for the transmission line corridor soils analysis, series with a mesic temperature regime are included in the mapping and descriptions of this section of the Site Law application. The revised temperature regime classifications now used in Maine do not affect soil based land use interpretations related to the Project.

Existing soil characteristics at the Merrill Road Converter Station, Fickett Road Substation, and West Forks and Moxie Gore termination station sites were identified by the Class B High Intensity Soil Surveys, conducted by Robert Vile Soil Consulting. Soils were mapped in accordance with the Maine Association of Professional Soil Scientist High Intensity Soil Survey Standards. Findings of the high intensity soil surveys at each site are summarized in Section 4.2.4. The high intensity soil survey maps and geotechnical reports are included in Attachment G. Additionally, an HDD Geotechnical Feasibility Memo for the Upper Kennebec River crossing is included in Attachment G.

The geotechnical reports provide a more detailed analysis of major limitations presented by the soil conditions at the substation sites and present potential design accommodations to address those limitations. In the locations where soils have limitations, proper engineering techniques will be implemented to overcome these limitations. This may include the removal of native soils and the importation of adequate soils.

4.2.2 Summary Description of Soils

Abram Sandy Loam – *Loamy, isotic, frigid Lithic Haplorthods*

Abram soils are very shallow, excessively drained soils formed in a thin glacial till on ridges and mountains. Depth to bedrock is less than 10 inches and there is no seasonal high-water table between the bedrock and the surface. Abram soils are hydrologic group D soils. Slopes range from 0 to 80 percent.

Adams Loamy Sand – *Sandy, isotic, frigid Typic Haplorthods*

Adams soils are very deep, somewhat excessively drained soils formed in glacio-fluvial or glacio-lacustrine sands on outwash plains, deltas, lake plains, moraines, terraces, and eskers. Depth to bedrock is greater than 60 inches, and Adams soils do not have a seasonal high-water table within 40 inches. Adams soils are hydrologic group A soils. Slopes within the program area range from 0 to 40 percent, with slopes greater than 8 percent classified as potentially highly erodible land.

Adams-Colton Association

The Adams-Colton Association soils map unit is comprised of Adams and Colton soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Adams soils are described above and Colton soils are described below.

Adams-Croghan Association

The Adams-Croghan Association soils map unit is comprised of Adams and Croghan soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Adams soils are described above and Croghan soils are described below.

Agawam Fine Sandy Loam – *Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Dystrudepts*

Agawam soils are very deep, well drained soils formed in sandy, water deposited materials on outwash plains and high stream terraces. Depth to bedrock is greater than 60 inches. Agawam soils do not have a seasonal water table within 40 inches, and are hydrologic group B soils. Slopes range from 0 to 15 percent, with slopes greater than 8 percent classified as potentially highly erodible land.

Allagash Very Fine Sandy Loam – *Coarse-loamy over sandy or sandy-skeletal, isotic, frigid Typic Haplorthods*

Allagash soils are very deep well drained soils formed in glacio-fluvial deposits on outwash plains and stream terraces. The seasonal high-water table is greater than 40 inches from the surface and depth to bedrock is greater than 60 inches. Allagash soils are hydrologic group B soils. Slopes range from 0 to 35 percent, with slopes less than 8 percent classified as potentially highly erodible land, and slopes of 5 to 15 percent as highly erodible land.

Belgrade Very Fine Sandy Loam – *Coarse-silty, mixed, active, mesic aquic Dystric Eutrudepts*
Belgrade soils are very deep, moderately well drained soils formed in glacio-lacustrine parent materials on terraces. The seasonal high-water table is 16 to 40 inches from the surface and depth to bedrock is greater than 60 inches. Belgrade soils are hydrologic group C soils. Slopes within the program area range from 0 to 25 percent, and are highly erodible land.

Bemis Gravelly Fine Sandy Loam - *Loamy, mixed, active, acid, shallow Aeric Cryaquepts*
Bemis soils consist of very deep, poorly drained soils on smooth, concave positions in valleys at higher elevations that form in dense glacial till. Slopes range from 0 to 15 percent.

Berkshire Fine Sandy Loam – *Coarse-loamy, isotic, frigid Typic Haplorthods*
Berkshire soils consist of very deep, well drained soils formed in till on glaciated uplands. The depth to bedrock is greater than 60 inches and there is no seasonal high-water table from 16 to 40 inches. Berkshire soils are hydrologic group C soils. Slopes range from 5 to 75 percent, with slopes less than 15 percent classified as potentially highly erodible land and slopes greater than 15 percent classified as highly erodible land.

Biddeford Silt Loam – *Fine, illitic, nonacid, frigid Histic Humaquepts*
Biddeford soils are very deep, very poorly drained soils formed in glacio-lacustrine or glacio-marine deposits on coastal lowlands and river valleys. Some areas have an organic surface horizon. As hydric soils, the seasonal high-water table is at the surface and depth to bedrock is greater than 60 inches. Biddeford soils are hydrologic group D soils. Slopes are nearly level.

Boothbay Silt Loam – *Fine-silty, mixed, superactive, frigid aquic Dystric Eutrudepts*
Boothbay soils are very deep, moderately well drained soils formed in glacio-lacustrine and glacio-marine parent materials on lake and marine plains. Depth to the seasonal high-water table is 16 to 40 inches, and depth to bedrock is greater than 60 inches. Boothbay soils are hydrologic group C soils. Slopes range from 3 to 45 percent, and are potentially highly erodible land where slopes are less than 15 percent and highly erodible land where slopes exceed 15 percent.

Brayton Fine Sandy Loam – *Loamy, mixed, active, nonacid, frigid, shallow Aeric Endoaquepts*
Brayton soils are very deep, poorly drained soils formed in dense glacial till in depressions and on toe-slopes. As hydric soils, Brayton soils have a seasonal high-water table that is at or near the surface. Depth

to bedrock is greater than 60 inches, and Brayton soils are hydrologic group C soils. Slopes range from 0 to 25 percent and are potentially highly erodible land.

Brayton-Colonel Association

The Brayton and Colonel Association map unit is comprised of Brayton and Colonel soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Brayton soils are described above and Colonel soils are described below.

Brayton-Peacham-Markey Association

The Brayton, Peacham, and Markey Association map unit is comprised of Brayton and Markey soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Brayton soils are described above and Markey and Peacham soils are both described below.

Bucksport – *Euic, frigid Typic Haplosaprists*

Bucksport soils are very deep, very poorly drained soils formed in well decomposed organic materials more than 51 inches thick over glacial till or glaciofluvial deposits. Slopes are nearly level and bedrock is greater than 60 inches.

Bucksport and Markey Complex

The Bucksport and Markey Complex map unit is comprised of Bucksport and Markey soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Bucksport soils are described above and Markey soils are described below.

Bucksport and Wonsqueak Mucks

The Bucksport and Wonsqueak Mucks map unit is comprised of Bucksport and Wonsqueak soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Bucksport soils are described above and Wonsqueak soils are described below.

Burnham – *Loamy, mixed, superactive, nonacid, frigid, shallow Histic Humaquepts*

Burnham soils consist of very deep, very poorly drained soils formed in dense glacial till in depressions. The depth to bedrock is greater than 60 inches and the water table is at or near the surface. Burnham soils are hydrologic group D soils. Slopes range from 0 to 5 percent.

Buxton Silt Loam – *Fine, illitic, frigid aquic Dystric Eutrudepts*

Buxton soils are very deep, moderately well drained soils formed in glacio-lacustrine and glacio-marine parent materials on coastal lowlands and river valleys. Depth to the seasonal high-water table is 16 to 40 inches, and depth to bedrock is greater than 60 inches. Buxton soils are hydrologic group C soils. Slopes within the program area range from 5 to 50 percent, and are potentially highly erodible land where slopes are less than 8 percent and highly erodible land where slopes exceed 8 percent.

Charles Silt Loam – *Coarse-silty, mixed, superactive, nonacid, frigid Aeric Fluvaquents*

Charles soils are very deep, poorly drained soils formed in alluvial deposits on flood plains. The seasonal high-water table is within 7 inches of the surface, and depth to bedrock is greater than 60 inches. Charles soils are hydrologic group C soils. Slopes range from 0 to 5 percent.

Charles-Cornish-Wonsqueak Complex

The Charles-Cornish-Wonsqueak Complex map unit is comprised of areas of Charles, Cornish and Wonsqueak soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Charles soils are described above and Cornish and Wonsqueak soils are both described below.

Charles-Medomak-Cornish Association

The Charles-Medomak-Cornish Association map unit is comprised of areas of Charles, Medomak and Cornish soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Charles soils are described above and Medomak and Cornish soils are both described below.

Charlton Fine Sandy Loam – *Coarse-loamy, mixed, active, mesic Typic Dystrudepts*

Charlton soils are very deep, well drained loamy soils formed in glacial till on till plains and hills. There is no seasonal high-water table within 40 inches of the surface, and depth to bedrock is greater than 60 inches. Charlton soils are hydrologic group B soils, and slopes range from 0 to 50 percent. Slopes less than 15 percent are classified as potentially highly erodible land and slopes greater than 15 percent are classified as highly erodible land.

Chesuncook Silt Loam - *Coarse-loamy, isotic, frigid Aquic Haplorthods*

Chesuncook soils are very deep, moderately well drained soils formed in dense glacial till on till plains, hills, and mountains. Slopes range from 5 to 45 percent, and depth to bedrock is greater than 65 inches.

Chesuncook-Elliottsville-Telos Association

The Chesuncook-Elliottsville-Telos Association map unit is comprised of areas of Chesuncook, Elliottsville and Telos soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Chesuncook soils are described above and Elliottsville and Telos soils are both described below.

Chesuncook-Telos Association

The Chesuncook-Telos Association map unit is comprised of areas of Chesuncook and Telos soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Chesuncook soils are described above and Telos soils are described below.

Colonel Fine Sandy Loam – *Loamy, isotic, frigid, shallow Aquic Haplorthods*

Colonel soils are somewhat poorly drained soils formed in basal till on drumlins and till ridges. A hardpan is present 10 to 20 inches from the surface, and depth to bedrock is more than 60 inches from the surface. The seasonal high-water table occurs above the hardpan, approximately 7 to 16 inches from the surface. Colonel soils are hydrologic group C soils, with slopes that range from 0 to 35 percent.

Colonel-Peru-Pillsbury Association

The Colonel-Peru-Pillsbury Association map unit is comprised of areas of Colonel, Peru, and Pillsbury soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Colonel soils are described above and Peru and Pillsbury are both described below.

Colonel-Pillsbury-Peru Association

The Colonel-Pillsbury-Peru Association map unit is comprised of areas of Colonel, Pillsbury, and Peru soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Colonel soils are described above and Pillsbury and Peru are both described below.

Colonel-Skerry-Pillsbury Association

The Colonel-Skerry-Pillsbury Association map unit is comprised of areas of Colonel, Skerry and Pillsbury soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Colonel soils are described above and Skerry and Pillsbury are both described below.

Colton Gravelly Loamy Coarse Sand – *Sandy-skeletal, isotic, frigid Typic Haplorthods*
Colton soils are very deep, excessively drained soils formed in glacio-fluvial deposits of terraces, kames, eskers, and outwash plains. There is no seasonal high-water table within 40 inches of the surface, and depth to bedrock is greater than 60 inches. Colton soils are hydrologic group A soils. Slopes range from 5 to 70 percent and are potentially highly erodible land.

Colton-Adams Association
The Colton-Adams Association soils map unit is comprised of Colton and Adams soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Adams and Colton soils are described above.

Colton-Hermon Association
The Colton-Hermon Association soils map unit is comprised of Colton and Hermon soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Colton soils are described above and Hermon soils are described below.

Cornish – *Coarse-silty, mixed, superactive, frigid Fluvaquentic Dystrudepts*
Cornish soils are very deep, somewhat poorly drained soils formed in alluvial deposits on flood plains. There is a seasonal high-water table between 7 and 16 inches of the surface, and depth to bedrock is greater than 60 inches. Cornish soils are hydrologic group C soils. Slopes range from 0 to 5 percent.

Croghan Loamy Sand – *Sandy, isotic, frigid Aquic Haplorthods*
Croghan soils consist of very deep, moderately well drained soils formed in deltaic or glacio-fluvial deposits on terraces and sand plains. There is a seasonal high-water table within approximately 30 inches of the surface and depth to bedrock is greater than 60 inches. Croghan soils are hydrologic group B soils. Slopes range from 0 to 15 percent.

Danforth – *Loamy-skeletal, isotic, frigid Typic Haplorthods*
Danforth soils consist of very deep, well drained soils that form in glacial till on till plains and ridges. Depth to bedrock is greater than 60 inches. Slopes range from 5 to 45 percent.

Danforth-Elliottsville Association

The Danforth-Elliottsville Association map unit is comprised of Danforth and Elliottsville soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Danforth soils are described above and Elliottsville soils are described below.

Dune Land

Dune lands include areas of windblown sands, generally located at the edge of waterbodies.

Elmwood Fine Sandy Loam – *Coarse-loamy over clayey, mixed over illitic, superactive, frigid Aquic Dystric Eutrudepts*

Elmwood soils are very deep, moderately well drained soils formed in a thin layer of loamy outwash materials deposited over clayey marine or lacustrine deposits on lake plains, marine plains, outwash plains, and deltas. There is a seasonal high-water table within 16 to 40 inches of the surface and depth to bedrock is greater than 60 inches. Elmwood soils are hydrologic group C soils. Slopes range from 0 to 25 percent.

Elliottsville Silt Loam - *Coarse-loamy, isotic, frigid Typic Haplorthods*

Elliottsville soils are moderately deep, well drained soils that formed in glacial till on till plains, hills, ridges and mountains. There is no seasonal high-water table within 40 inches of the surface and depth to bedrock ranges from 20 to 40 inches. Slopes range from 5 to 65 percent.

Elliottsville-Monson Complex

The Elliottsville-Monson Association map unit is comprised of Elliottsville and Monson soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Elliottsville soils are described above and Monson soils are described below.

Fryeburg Silt Loam – *Coarse-silty, mixed, superactive, frigid Fluventic Dystrudepts*

Fryeburg soils are very deep, well drained soils formed in alluvial deposits on flood plains. Slopes range from 0 to 8 percent. There is no seasonal high-water table within 40 inches of the surface, and depth to bedrock is greater than 60 inches. Fryeburg soils are hydrologic group B soils. Slopes range from 0 to 8 percent.

Hadley Silt Loam – *Coarse-silty, mixed, superactive, nonacid, mesic Typic Udifluvents*
Hadley soils are very deep well drained soils formed in silty alluvium on flood plains. Hadley soils are hydrologic group B soils, with a depth to bedrock greater than 60 inches. There is no seasonal high-water table within 40 inches of the surface. Slopes range from 0 to 5 percent.

Hartland Very Fine Sandy Loam – *Coarse-silty, mixed, active, mesic Dystric Eutrudepts*
Hartland soils consist of very deep, well drained soils on terraces and glacial lake plains formed in silty eolian or glaciolacustrine deposits. Depth to bedrock is greater than 60 inches, and there is no seasonal high-water table within 40 inches of the surface. Hartland soils are hydrologic group B soils. Slopes range from 0 to 50 percent, with slopes less than 8 percent potentially highly erodible land and slopes greater than 8 percent highly erodible land.

Hermon Fine Sandy Loam – *Sandy-skeletal, isotic, frigid Typic Haplorthods*
Hermon soils very deep, somewhat excessively drained soils on upland till plains, hills, and ridges. Hermon soils have formed in ablation till. There is no seasonal high-water table and depth to bedrock is greater than 60 inches. Hermon soils are hydrologic group A soils. Slopes within the program area range from 0 to 60 percent, and are potentially highly erodible land.

Hermon-Monadnock Association
The Hermon-Monadnock Association map unit is comprised of Hermon and Monadnock soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Hermon soils are described above and Monadnock soils are described below.

Hermon-Rawsonville-Skerry Association
The Hermon-Rawsonville-Skerry Association map unit is comprised of Hermon, Rawsonville, and Skerry soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Hermon soils are described above and Rawsonville and Skerry soils are both described below.

Hermon-Skerry Association
The Hermon-Skerry Association map unit is comprised of Hermon and Skerry soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Hermon soils are described above and Skerry soils are described below.

Hinckley Gravelly Sandy Loam – *Sandy-skeletal, mixed, mesic Typic Udorthents*
Hinckley soils consist of very deep, excessively drained soils formed in water-sorted materials, and are located on terraces, outwash plains, deltas, kames, and eskers. There is no seasonal high-water table within 40 inches of the surface, and depth to bedrock is greater than 60 inches. Hinckley soils are hydrologic group A soils with slopes that range from 0 to 60 percent, and are potentially highly erodible land.

Hogback Gravelly Fine Sandy Loam – *Loamy, isotic, frigid Lithic Haplohumods*
Hogback soils consist of shallow, well drained soils on glaciated uplands that formed in loamy till. There is no seasonal high-water table within 40 inches of the surface, and depth to bedrock ranges from 10 to 20 inches. Slopes range from 5 to 70 percent.

Hogback-Abram Complex
The Hogback-Abram Complex map unit is comprised of Hogback and Abram soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Hogback and Abram soils are both described above.

Hogback-Rawsonville Complex
The Hogback-Rawsonville Complex map unit is comprised of Hogback and Rawsonville soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Hogback soils are described above and Rawsonville soils are described below.

Hollis Fine Sandy Loam – *Loamy, mixed, active, mesic Lithic Dystrudepts*
Hollis soils are shallow, well drained to somewhat excessively drained soils formed in a thin mantle of ablation till derived mainly from gneiss, schist, and granite on bedrock-controlled hills and ridges. Some areas have many rock outcrops. There is no seasonal high-water table and depth to bedrock is within 20 inches of the surface. Hollis soils are hydrologic group C and D soils with slopes that range from 0 to 60 percent. Hollis soils are potentially highly erodible land where slopes are less than 8 percent, and highly erodible land where slopes are greater than 8 percent.

Knob Lock – *Dysic, frigid Lithic Udifolists*
Knob Lock soils consist of very shallow, well drained through excessively drained organic soils on mountains and hills. There is no seasonal high-water table and depth to bedrock ranges from 3 to 20 inches. Slopes range from 3 to 80 percent.

Lamoine – *Frigid Aeric Haplaquepts*

Lamoine soils are lower to intermediate, somewhat poorly drained soils formed in lowlands. The depth to bedrock is greater than 60 inches, and a seasonal (November – June) perched water table is present from 0.5 to 2.0 feet. Lamoine soils are hydrologic group D soils, with slopes that range from 0 to 15 percent.

Lamoine-Buxton Complex

The Lamoine-Buxton Complex map unit is comprised of areas of Lamoine and Buxton soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Lamoine and Buxton soils are both described above.

Leicester Fine Sandy Loam – *Coarse-loamy, mixed, active, acid, mesic Aeric Endoaquepts*

Leicester soils are very deep, poorly drained hydric soils formed in friable till. They are located in nearly level or gently sloping drainage ways and on foot-slope and toe-slope positions on hills. Depth to bedrock is greater than 60 inches and the seasonal high-water table is within 12 inches of the surface. Leicester soils are hydrologic group C soils and slopes range from 0 to 8 percent.

Limerick Silt Loam – *Coarse-silty, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts*

Limerick soils are very deep, poorly drained hydric soils formed in recent alluvium on floodplains. The seasonal high-water table is within 12 inches of the surface, and bedrock is deeper than 60 inches of the surface. Limerick soils are hydrologic group C soils with nearly level slopes.

Lovewell – *Coarse-silty, mixed, superactive, frigid Fluvaquentic Dystrudepts*

Lovewell soils are very deep, moderately well drained soils formed in alluvial sediments on flood plains. There is a seasonal high-water table from 16 to 40 inches from the surface, and the depth to bedrock is greater than 60 inches. Lovewell soils are hydrologic group B soils. Slopes range from 0 to 5 percent.

Lovewell-Cornish Complex

The Lovewell-Cornish Complex map unit is comprised of areas of Lovewell and Cornish soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Lovewell and Cornish soils are both described above.

Lyman Fine Sandy Loam – *Loamy, isotic, frigid Lithic Haplorthods*

Lyman soils are shallow, somewhat excessively drained soils formed in ablation till on rocky hills, mountains, and high plateaus. Some map units have many rock outcrops. There is no seasonal high-water table, and depth to bedrock is typically 10 to 20 inches of the surface. Lyman soils are hydrologic group C and D soils with slopes that range from 5 to 80 percent. Lyman soils are potentially highly erodible land where slopes are less than 8 percent, and highly erodible land where slopes are greater than 8 percent.

Lyman-Rock Outcrop-Tunbridge Complex

The Lyman-Rock Outcrop-Tunbridge Complex map unit is comprised of Lyman and Tunbridge soils, and rock outcrops that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Lyman soils are described above and Tunbridge soils are described below.

Lyman-Tunbridge-Abram Complex

The Lyman-Tunbridge-Abram Complex map unit is comprised of areas of Lyman, Tunbridge, and Abram soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Lyman and Abram soils are both described above and Tunbridge soils are described below.

Lyman-Tunbridge-Rock Outcrop

The Lyman-Tunbridge-Rock Outcrop map unit is comprised of Lyman and Tunbridge soils, and rock outcrops that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Lyman soils are described above, and Tunbridge soils are described below.

Madawaska Fine Sandy Loam – *Coarse-loamy over sandy or sandy-skeletal, isotic, frigid Aquic Haplorthods*

Madawaska soils consist of very deep, moderately well drained and somewhat poorly drained soils formed in glacio-fluvial deposits on outwash plains and stream terraces. The seasonal high-water table is 16 to 40 inches below the surface and depth to bedrock is greater than 60 inches. Madawaska soils are hydrologic group B soils. Slopes range from 0 to 15 percent and are potentially highly erodible land.

Madawaska-Allagash Association

The Madawaska-Allagash Association map unit is comprised of areas of Madawaska and Allagash soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Madawaska and Allagash soils are both described above.

Made Land – *Udorthents*

Made land includes human-altered areas comprised of fill materials. The properties and characteristics of these soils are highly variable.

Markey – *Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists*

Markey soils are very deep, very poorly drained organic soils. These soils have formed in thick organic materials over sandy deposits in depressions. Depth to bedrock is greater than 60 inches and the water table is usually or always at the surface.

Marlow Very Stony Fine Sandy Loam – *Coarse-loamy, isotic, frigid Oxyaquic Haplorthods*

Marlow soils consist of very deep, well drained soils formed in loamy till on drumlins and glaciated uplands. Marlow soils are moderately deep to densic contact. There is no seasonal high-water table within 40 inches of the surface and depth to bedrock is greater than 60 inches. Marlow soils are in hydrologic group C. Slopes range from 0 to 60 percent, with slopes less than 15 percent potentially highly erodible land and slopes greater than 15 percent highly erodible land.

Marlow-Berkshire Very Stony Fine Sandy Loam

The Marlow-Berkshire map unit is comprised of areas of Marlow and Berkshire soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Marlow and Berkshire soils are both described above.

Marlow-Peru Association

The Marlow-Peru Association map unit is comprised of areas of Marlow and Peru soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Marlow soils are described above and Peru soils are described below.

Marlow-Peru-Rawsonville Association

The Marlow-Peru-Rawsonville Association map unit is comprised of areas of Marlow, Peru, and Rawsonville soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Marlow soils are described above and Peru and Rawsonville soils are both described below.

Masardis and Masardis Variant Fine Sandy Loam – *Sandy-skeletal, isotic, frigid Typic Haplorthods*
Masardis soils consist of very deep, somewhat excessively drained soils formed in glaciofluvial or ice contact deposits. Depth to bedrock is deeper than 60 inches and there is no seasonal high-water table within 40 inches of the surface. Slopes range from 0 to 80 percent.

Masardis-Danforth-Peacham Association
The Masardis-Danforth-Peacham Association map unit is comprised of areas of Masardis, Danforth, and Peacham soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Masardis and Danforth soils are both described above and Peacham soils are described below.

Medomak Silt Loam – *Coarse-silty, mixed, superactive, nonacid, frigid Fluvaquentic Humaquepts*
Medomak soils consist of very deep, very poorly drained hydric soils formed in alluvial deposits on flood plains. Depth to bedrock is greater than 60 inches and the seasonal high-water table is less than 12 inches from the surface. Medomak soils are hydrologic group D soils and slopes range from 0 to 2 percent.

Melrose Fine Sandy Loam – *Coarse-loamy over clayey, mixed over illitic, superactive, frigid Oxyaquic Dystrudepts*
Melrose soils consist of very deep; well drained soils formed in a thin layer of loamy outwash materials over clayey marine or lacustrine deposits. Melrose soils are located on lake and marine plains, outwash plains, and deltas. The depth to bedrock is greater than 60 inches and there is no seasonal high-water table within 40 inches of the surface. Melrose soils are hydrologic group C soils, and are potentially highly erodible land. Slopes range from 0 to 50 percent.

Merrimac Fine Sandy Loam – *Sandy, mixed, mesic Typic Dystrudepts*
Merrimac soils are very deep, somewhat excessively drained soils formed in glacial outwash on terraces and plains and other glacio-fluvial landforms. There is no seasonal high-water table, and depth to bedrock is greater than 60 inches from the surface. Merrimac soils are hydrologic group B soils. Slopes range from 0 to 35 percent and are potentially highly erodible land.

Mixed Alluvial Land
Mixed alluvial land includes soils that have formed in alluvial deposits along river floodplains.

Monadnock – *Coarse-loamy over sandy or sandy-skeletal, isotic, frigid Typic Haplorthods*
The Monadnock soils are very deep, well drained soils that formed in a loamy mantle overlying sandy glacial till on upland hills, plains, and mountain side slopes. Depth to bedrock is deeper than 60 inches and the seasonal high-water table is deeper than 40 inches from the surface. Monadnock soils are hydrologic group B soils. Slopes range from 0 to 60 percent.

Monarda Silt Loam – *Loamy, mixed, active, acid, frigid, shallow Aeric Endoaquepts*
Monarda soils are very deep, poorly drained hydric soils formed in dense glacial till on lower slopes or in slight depressions on till plains. They are shallow to densic contact. The depth to bedrock is greater than 60 inches and the seasonal high-water table is within 12 inches of the surface. Monarda soils are hydrologic group D soils, and slopes range from 0 to 15 percent.

Monarda-Burnham Complex
The Monarda and Burnham map unit is comprised of areas of Monarda and Burnham soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Monarda and Burnham soils are both described above.

Monarda-Telos Complex
The Monarda and Telos map unit is comprised of areas of Monarda and Telos soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Monarda soils are described above and Telos soils are described below.

Monson Silt Loam – *Loamy, isotic, frigid Lithic Haplorthods*
Monson soils are shallow, somewhat excessively drained soils that form in glacial till on knolls of till plains, and on hills, ridges, and mountains. Depth to bedrock is 10 to 20 inches, and there is no seasonal high-water table. Slopes range from 5 to 60 percent.

Monson-Elliottsville-Knob Lock Complex
The Monson-Elliottsville-Knob Lock map unit is comprised of areas of Monson, Elliottsville, and Knob Lock soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Monson, Elliottsville, and Knob Lock soils are each described above.

Naumburg Sand – *Sandy, isotic, frigid Typic Endoaquods*

Naumburg soils are very deep, poorly drained hydric soils formed in sandy deltaic or glaciofluvial deposits on sand plains and terraces. Naumburg soils are located at topographically low positions on the landscape. The seasonal high-water table is typically within 12 inches of the surface, and depth to bedrock is greater than 60 inches. Naumburg soils are hydrologic group C soils. Slopes are nearly level.

Nicholville Silt Loam – *Coarse-silty, isotic, frigid Aquic Haplorthods*

Nicholville soils are very deep, moderately well drained soils formed in wind or water deposited material having a high content of silt and very fine sand. Depth to bedrock is greater than 60 inches and the seasonal high-water table occurs from 16 to 40 inches. Nicholville soils are hydrologic group C soils. Slopes range from 0 through 60 percent.

Ninigret Fine Sandy Loam – *Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Aquic Dystrudepts*

Ninigret soils are very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. Ninigret soils are formed on glaciofluvial landforms, and are typically found in slight depressions and broad drainage ways. Depth to bedrock is greater than 60 inches and the seasonal high-water table is from 16 to 40 inches. Ninigret soils are hydrologic group B soils, and are potentially highly erodible land. Slopes range from 0 to 15 percent.

Paxton Fine Sandy Loam – *Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts*

Paxton soils are very deep, well drained loamy soils formed in dense basal till. The depth to bedrock is greater than 60 inches and there is no seasonal high-water table within 40 inches of the surface. Densic contact is moderately deep. Paxton soils are hydrologic group C soils. Slopes range from 0 to 45 percent, with slopes less than 15 percent being potentially highly erodible land and slopes greater than 15 percent being highly erodible land.

Peat and Muck

The Peat and Muck map unit is comprised of thick organic deposits formed as a result of continuous or nearly continuous saturation. This map unit is located in wetlands and depressions on the landscape, and has not been correlated to a specific soil series.

Peacham – *Loamy, mixed, active, nonacid, frigid, shallow Histic Humaquepts*

The Peacham soils are very poorly drained soils in depressions and drainage-ways on glaciated uplands formed in organic materials less than 16 inches thick underlain by dense, loamy till. Depth to bedrock is greater than 60 inches and the seasonal high-water table is at the surface most or all of the time. Peacham soils are hydrologic group D soils. Slopes range from 0 to 10 percent.

Peru Fine Sandy Loam – *Coarse-loamy, isotic, frigid Aquic Haplorthods*

Peru soils are very deep, moderately well drained soils formed in dense loamy glacial till. The depth to bedrock is greater than 60 inches and the seasonal high-water table is from 16 to 40 inches. Peru soils are hydrologic group C soils. Slopes range from 0 to 35 percent and are potentially highly erodible land.

Peru-Colonel-Marlow Association

The Peru-Colonel-Marlow map unit is comprised of areas of Peru, Colonel, and Marlow soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Peru, Colonel, and Marlow soils are each described above.

Peru-Colonel-Rawsonville Association

The Peru-Colonel-Rawsonville map unit is comprised of areas of Peru, Colonel, and Rawsonville soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Peru, Colonel, and Rawsonville soils are each described above.

Peru-Marlow Association

The Peru and Marlow map unit is comprised of areas of Peru and Marlow soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Peru and Marlow soils are both described above.

Pillsbury Cobbly Loam – *Coarse-loamy, mixed, superactive, acid, frigid Humic Endoaquepts*

Pillsbury soils are moderately deep to a dense substratum and very deep to bedrock soils that form in loamy lodgment till in glaciated uplands and lowlands. Depth to bedrock is greater than 65 inches, and there is no seasonal high-water table. Slopes range from 0 to 15 percent.

Pillsbury-Peacham Association

The Pillsbury and Peacham map unit is comprised of areas of Pillsbury and Peacham soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Pillsbury and Peacham soils are both described above.

Pits, Sand and Gravel – *Udorthents*

Gravel pits are human-altered areas, usually within sandy textured glacial outwash or ice-contact deposits. Soils within these areas have been excavated and cut, typically for the purpose of sand and gravel extraction.

Podunk Fine Sandy Loam – *Coarse-loamy, mixed, active, frigid Fluvaquentic Dystrudepts*

Podunk soils are very deep, moderately well drained soils formed in recent alluvium on floodplains. The seasonal high-water table is typically within 16 to 40 inches of the surface, and depth to bedrock is greater than 60 inches. Podunk soils are hydrologic group B soils with nearly level slopes.

Rawsonville Very Fine Sandy Loam – *Coarse-loamy, isotic, frigid Typic Haplohumods*

Rawsonville soils are moderately deep, well drained soils that form in loamy till on glaciated uplands. Depth to bedrock ranges from 20 to 40 inches, and there is no seasonal high-water table. Slopes range from 3 through 70 percent.

Ricker – *Dysic Lithic Cryofolists*

Ricker soils are shallow to very shallow and well drained to excessively well drained organic soils that form in thin organic deposits underlain in most places by a very thin mineral horizon over bedrock on mountains and hills. Depth to bedrock is within 20 inches of the surface. Slopes range from 5 to 80 percent.

Ricker-Saddleback-Rock Outcrop Complex

The Ricker, Saddleback, and Rock Outcrop map unit is comprised of areas of Ricker, Saddleback, and Rock Outcrop soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Ricker soils are described above and Saddleback soils are described below.

Ridgebury Fine Sandy Loam – *Loamy, mixed, active, acid, mesic, shallow Aeric Endoaquepts*

Ridgebury soils are very deep, poorly drained hydric soils formed in till derived mainly from granite, gneiss, and schist. Densic contact is typically 14 to 19 inches, and depth to bedrock is greater than 60

inches. The seasonal high-water table is within 12 inches of the surface. Ridgebury soils are hydrologic group C soils. Slopes range from 0 to 15 percent.

Rock Outcrop-Thorndike-Lyman Association

The Rock Outcrop, Thorndike, and Lyman map unit is comprised of areas of Rock Outcrop, Thorndike, and Lyman soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Lyman soils are described above and Thorndike soils are described below.

Roundabout – *Frigid Aeric Haplaquepts*

Roundabout soils are poorly drained soils that form in depressions and lowlands. Depth to bedrock is greater than 60 inches, and a perched water table is present at 0.5 to 1.5 feet from November through May or during periods of excessive precipitation. Roundabout soils are hydrologic group C soils. Slopes range from 0 to 10 percent.

Roundabout-Croghan Association

The Roundabout and Croghan map unit is comprised of areas of Roundabout and Croghan soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Roundabout and Croghan soils are both described above.

Saddleback Fine Sandy Loam – *Loamy, isotic Lithic Humicryods*

Saddleback soils are shallow, well drained soils that form in glacial till on mountains. Depth to bedrock ranges from 10 to 20 inches, and slopes range from 3 to 80 percent.

Saddleback-Ricker Complex

The Saddleback and Ricker map unit is comprised of areas of Saddleback and Ricker soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Saddleback and Ricker soils are both described above.

Scantic Silt Loam – *Fine, illitic, nonacid, frigid Typic Epiaquepts*

Scantic soils consist of very deep, poorly drained hydric soils formed in glacio-marine or glacio-lacustrine deposits on coastal lowlands and river valleys. The seasonal high-water table is within 12 inches of the surface and bedrock is deeper than 60 inches. Scantic soils are in soil hydrologic group D, and have slopes that range from 0 to 10 percent.

Scarboro Fine Sandy Loam – *Sandy, mixed, mesic Histic Humaquepts*
Scarboro soils are very deep, very poorly drained hydric soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions. The depth to bedrock is greater than 60 inches and the water table is at or near the surface. Scarboro soils are hydrologic group D soils. Slopes range from 0 to 5 percent.

Scio Silt Loam – *Coarse-silty, mixed, active, mesic Aquic Dystrudepts*
Scio soils are very deep, moderately well drained soils formed in eolian, lacustrine, or alluvial sediments dominated by silt and very fine sand. These soils are on terraces, old alluvial fans, and in upland basins. Scio soils have a seasonal high-water table from 16 to 40 inches from the surface and depth to bedrock is greater than 60 inches. Scio soils are hydrologic group B and C soils, depending on slope. Slopes range from 0 to 25 percent, with slopes less than 8 percent being potentially highly erodible land, and slopes greater than 8 percent being highly erodible land.

Sisk Silt Loam – *Coarse-loamy, isotic Oxyaquic Humicryods*
Sisk soils are very deep, well drained soils that form in dense glacial till in high elevation valleys and on side slopes of mountains. Stones and boulders typically cover from 0 to 15 percent of the surface. Slopes range from 10 to 60 percent.

Skerry Fine Sandy Loam – *Coarse-loamy, isotic, frigid Aquic Haplorthods*
Skerry soils are very deep, moderately well drained soils formed in loamy materials over dense, sandy glacial till on drumlins and glaciated uplands. The depth to hardpan generally ranges from 20 to 38 inches. Bedrock depth is greater than 60 inches, and the seasonal high-water table typically occurs above the hardpan between 16 and 40 inches. Skerry soils are hydrologic group C soils, with slopes that range from 0 to 25 percent.

Skowhegan Loamy Fine Sand – *Sandy, isotic, frigid Aquic Haplorthods*
Skowhegan soils are very deep, moderately well and somewhat poorly drained soils formed in glaciofluvial deposits on outwash plains and stream terraces. Bedrock is greater than 60 inches from the surface, and the seasonal high-water table often occurs 12 to 24 inches from the surface. Skowhegan soils are hydrologic group B soils with slopes that range from 0 to 10 percent.

Stetson Fine Sandy Loam – *Sandy-skeletal, isotic, frigid Typic Haplorthods*
Stetson soils are very deep, well drained, and somewhat excessively drained soils on outwash plains, terraces, kames, and eskers. These soils formed in glaciofluvial deposits derived mainly from slate, shale, and phyllite, with lesser amounts of gneiss, granite, and limestone. The depth to bedrock is greater than 60 inches and there is no seasonal high-water table within 40 inches of the surface. Stetson soils are hydrologic group B soils. Slopes range from 0 to 60 percent.

Suffield Silt Loam – *Coarse-silty over clayey, mixed, active, mesic Dystric Eutrudepts*
Suffield soils consist of very deep, well drained soils formed in lacustrine or marine sediments, located primarily on gently sloping to very steep dissected plains. There is no water table within 40 inches of the surface and bedrock is deeper than 60 inches. Suffield soils are hydrologic group C soils, and are highly erodible land. Slopes range from 5 to 45 percent.

Sulfaquents – *Sulfaquents*
In Maine, sulfaquents are poorly drained to very poorly drained hydric soils of estuarine wetlands and tidal marshes. These soils may form in a variety of parent materials, but are typically formed in glaciomarine deposits. Sulfaquent map units have not been correlated to the series level of Soil Taxonomy.

Sulfihemists – *Sulfihemists*
In Maine, sulfihemists are very poorly drained hydric soils with an organic surface horizon in estuarine wetlands and salt marshes. These soils may form in a variety of parent materials, but are typically formed in glaciomarine deposits. Sulfihemist map units have not been correlated to the series level of Soil Taxonomy.

Sunday Loamy Fine Sand – *Mixed, frigid Typic Udipsamments*
Sunday soils are very deep, excessively drained soils form in sandy alluvial deposits on floodplains. Flooding varies from once or twice a year to once in 10 years. Bedrock is deeper than 60 inches. Slopes are nearly level.

Surplus Sandy Loam – *Coarse-loamy, isotic Aquic Haplocryods*
Surplus soils are very deep, moderately well drained and somewhat poorly drained soils that form in dense till on mountain side slopes. Stones and boulders typically cover 0 to 15 percent of the surface. Depth to bedrock is greater than 60 inches. Slopes range from 5 to 45 percent.

Surplus-Bemis Association

The Surplus and Bemis map unit is comprised of areas of Surplus and Bemis soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Surplus and Bemis soils are both described above.

Surplus-Sisk Association

The Surplus and Sisk map unit is comprised of areas of Surplus and Sisk soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Surplus and Sisk soils are both described above.

Sutton Loam – *Coarse-loamy, mixed, active, mesic Aquic Dystrudepts*

Sutton soils are very deep, moderately well drained loamy soils formed in till. They are nearly level to strongly sloping soils on plains, low ridges, and hills, typically on lower slopes and in slight depressions. The depth to bedrock is greater than 60 inches and there is a seasonal high-water table from 16 to 40 inches. Sutton soils are hydrologic group C soils. Slopes range from 0 to 15 percent.

Swanton Fine Sandy Loam – *Coarse-loamy over clayey, mixed over illitic, superactive, nonacid, frigid Aeric Epiaquepts*

Swanton soils are very deep, poorly drained hydric soils formed in a thin mantle of loamy outwash materials over clayey marine or lacustrine deposits on lake and marine plains, and outwash plains and deltas. The depth to bedrock is greater than 60 inches and there is a seasonal high-water table within 12 inches of the surface. Swanton soils are hydrologic group C soils. Slopes range from 0 to 10 percent.

Swanville Silt Loam – *Fine-silty, mixed, active, nonacid, frigid Aeric Epiaquepts*

Swanville soils are very deep, poorly drained hydric soils formed in glaciolacustrine or glaciomarine deposits on lake and marine plains. The depth to bedrock is greater than 60 inches, and the seasonal high-water table is within 12 inches of the surface. Swanville soils are hydrologic group C soils. Slopes range from 0 to 10 percent.

Swanville-Boothbay Association

The Swanville-Boothbay Association includes map units of Swanville and Boothbay soils that form a pattern on the landscape that cannot be differentiated at the mapped scale. Swanville and Boothbay soils are both described above.

Telos Silt Loam – *Loamy, isotic, frigid, shallow Aquic Haplorthods*

Telos soils are shallow to dense lodgement till and very deep to bedrock, somewhat poorly drained soils that form in till on till plains, hills, and ridges. Bedrock is deeper than 60 inches. Slopes range from 0 to 25 percent.

Telos-Chesuncook Association

The Telos-Chesuncook Association includes map units of Telos and Chesuncook soils that form a pattern on the landscape that cannot be differentiated at the mapped scale. Telos and Chesuncook soils are both described above.

Telos-Chesuncook-Elliottsville Association

The Telos-Chesuncook-Elliottsville Association includes map units of Telos, Chesuncook, and Elliottsville soils that form a pattern on the landscape that cannot be differentiated at the mapped scale. Telos, Chesuncook, and Elliottsville soils are each described above.

Telos-Monarda-Monson Association

The Telos-Monarda-Monson Association includes map units of Telos, Monarda, and Monson soils that form a pattern on the landscape that cannot be differentiated at the mapped scale. Telos, Monarda, and Monson soils are each described above.

Thorndike Silt Loam – *Loamy-skeletal, isotic, frigid Lithic Haplorthods*

Thorndike soils are shallow, somewhat excessively drained soils formed in glacial till on hills and mountains. The depth to bedrock ranges from 10 to 20 inches, and there is no seasonal high-water table. Thorndike soils are hydrologic group C soils. Slopes range from 0 to 45 percent.

Tunbridge – *Coarse-loamy, isotic, frigid Typic Haplorthods*

Tunbridge soils consist of moderately deep, well drained soils on glaciated uplands formed in loamy glacial till. The depth to bedrock is 20 to 40 inches, and there is no seasonal high-water table. Tunbridge soils are hydrologic group C soils. Slopes range from 0 to 75 percent, and are potentially highly erodible land.

Tunbridge-Berkshire-Peru Association

The Tunbridge-Berkshire-Peru Association includes map units of Tunbridge, Berkshire and Peru soils that form a pattern on the landscape that cannot be differentiated at the mapped scale. Tunbridge, Berkshire and Peru soils are each described above.

Tunbridge-Lyman Complex

The Tunbridge-Lyman Complex is comprised of areas of Tunbridge and Lyman soils that form a pattern on the landscape that is too intermingled to differentiate at the mapped scale. Tunbridge soils are described below and Lyman soils are described above.

Udorthents – *Udorthents*

Udorthents are human-altered soils such filled land, and stripped/cut areas. The properties and characteristics of these soils are highly variable.

Udorthents-Urban Land Complex – *Udorthents*

The Udorthents-Urban Land Complex map unit includes areas of Udorthents (described above) and urban land in a pattern that is too mixed to differentiate at the mapped scale. This map unit corresponds to human-altered soils and developed areas.

Urban Land

Urban land includes developed areas where soils have been altered.

Walpole Fine Sandy Loam – *Sandy, mixed, mesic Aeric Endoaquepts*

Walpole soils are very deep, poorly drained hydric soils formed in outwash in low-lying positions on terraces and plains. The depth to bedrock is greater than 60 inches and the seasonal high-water table is within 12 inches of the surface. Walpole soils are hydrologic group C soils. Slopes range from 0 to 8 percent.

Whately Fine Sandy Loam – *Coarse-loamy over clayey, mixed over illitic, superactive, nonacid, frigid Mollic Epiaquepts*

Whately soils are very deep, very poorly drained hydric soils formed in thin loamy outwash over clayey marine or lacustrine deposits on lakes and marine plains, and outwash plains and deltas. The depth to bedrock is greater than 60 inches, and there is a water table at or near the surface. Whately soils are hydrologic group D soils. Slopes are generally less than 5 percent.

Winooski Silt Loam – *Coarse-silty, mixed, active, mesic Fluvaquentic Dystrudepts*
Winooski soils are very deep, moderately well drained, and have formed in alluvial material on nearly level floodplains. The seasonal high-water table is 16 to 40 inches below the surface, and depth to bedrock is greater than 60 inches. Winooski soils are hydrologic group B soils. Slopes are nearly level.

Wonsqueak Mucky Peat – *Loamy, mixed, euic, frigid Terric Haplosaprists*
Wonsqueak soils are very deep; very poorly drained hydric soils formed in well decomposed (sapric) organic soil materials over loamy mineral material. Wonsqueak soils form in depressions in a variety of surficial deposits. Surface horizons are frequently saturated by shallow groundwater, and depth to bedrock is greater than 60 inches. Slopes are nearly level to less than 5 percent.

Woodbridge Fine Sandy Loam – *Coarse-loamy, mixed, active, mesic Aquic Dystrudepts*
Woodbridge soils are very deep, moderately well drained loamy soils formed in dense till. They are nearly level to moderately steep soils on till plains, hills, and drumlins. The depth to bedrock is greater than 60 inches, and there is a seasonal high-water table from 16 to 40 inches. A hardpan is present from 20 to 40 inches. Woodbridge soils are hydrologic group C soils. Slopes range from 0 to 25 percent and are potentially highly erodible land.

4.2.3 Soils Within Specific NECEC Corridors

Soils mapped within each specified NECEC Project transmission line corridor component are discussed below. In addition, hydric soils in each of the transmission component are specified. Based on the Applicant's analysis of SSURGO mapping, soils within the Project's transmission line corridor components will accommodate NECEC construction activities. Soil constraints within the Project's transmission line corridor components will be managed and mitigated through implementation of erosion and sediment control measures incorporated in CMP's Environmental Guidelines, proper site and Project design, and special construction procedures.

4.2.3.1 Segment 1

Soils located along this Segment are depicted on the Floodplain and Soils Series Maps. Mapped hydric soils along this line corridor include Biddeford, Brayton, Bucksport, Charles, Leicester, Limerick, Mixed Alluvial Sand, Monarda, Naumberg, Pillsbury, Roundabout, Scantic, Scarboro, Swanton, Swanville, Whalpole, and Whately series. The Peat and Muck map unit is also hydric and found within this line corridor. On-site wetland delineations have been completed within this transmission line corridor and are

depicted on the Natural Resources Maps, which provide a more accurate and detailed depiction of wetland boundaries than can be estimated from SSURGO hydric soil mapping.

4.2.3.2 Segment 2

Soils located along this Segment are depicted on the Floodplain and Soils Series Maps. Mapped hydric soils along this line corridor include Biddeford, Brayton, Bucksport, Charles, Leicester, Limerick, Mixed Alluvial Sand, Monarda, Naumberg, Pillsbury, Roundabout, Scantic, Scarboro, Swanton, Swanville, Whalpole, and Whately series. The Peat and Muck map unit is also hydric and found within this line corridor. On-site wetland delineations have been completed within this transmission line corridor and are depicted on the Natural Resources Maps, which provide a more accurate and detailed depiction of wetland boundaries than can be estimated from SSURGO hydric soil mapping.

4.2.3.3 Segment 3

Soils located along this Segment are depicted on the Floodplain and Soils Series Maps. Mapped hydric soils along this line corridor include Biddeford, Brayton, Bucksport, Charles, Leicester, Limerick, Mixed Alluvial Sand, Monarda, Naumberg, Pillsbury, Roundabout, Scantic, Scarboro, Swanton, Swanville, Whalpole, and Whately series. The Peat and Muck map unit is also hydric and found within this line corridor. Verifications of water resource surveys previously conducted by CMP have been completed within this rebuild transmission line corridor and are depicted on the Natural Resources Maps, which provide a more accurate and detailed depiction of wetland boundaries than can be estimated from SSURGO hydric soil mapping.

4.2.3.4 Segment 4

Soils located along this Segment are depicted on the Floodplain and Soils Series Maps. Hydric soils along this rebuild transmission line corridor include the Biddeford, Leicester, Limerick, Scantic, Scarboro, Swanton, Walpole, and Whately series. The Peat and Muck map unit is also hydric and found within these line sections. Verifications of water resource surveys previously conducted by CMP have been completed within this rebuild transmission line corridor and are depicted on the Natural Resources Maps, which provide a more accurate and detailed depiction of wetland boundaries than can be estimated from SSURGO hydric soil mapping.

4.2.3.5 Segment 5

Soils located along this Segment are depicted on the Floodplain and Soils Series Maps. Mapped hydric soils along this transmission line corridor include the Biddeford, Brayton, Ridgebury, Scantic, Sulfihemists, Sulfaquents, and Swanville series. Verifications of water resource surveys previously

conducted by CMP have been completed within this 345kV transmission line corridor and are depicted on the Natural Resources Maps, which provide a more accurate and detailed depiction of wetland boundaries than can be estimated from SSURGO hydric soil mapping.

4.2.3.6 Soils and Transmission Line Structures

Typically, the installation of transmission line structures requires the embedded depth to be 10% of the pole length plus two feet for wood structures, which is easily supported by nearly all soil types across the Project, and 20% +/- of structure length for steel structures. In some instances where unconsolidated soils (e.g., peat and mucky soils) exist, additional methods of structural support may be required. Generally, in these instances pole butts or companion poles are installed below ground and immediately adjacent to the pole to be installed and are then bolted to the pole. Additionally, guy wires with anchors may be installed around structures to provide additional support.

4.2.4 Soils at Proposed Substations and Termination Stations

CMP completed Class B high intensity soil surveys and Geotechnical Reports for the Merrill Road Converter Station, the Fickett Road Substation, and the Moxie Gore and West Forks Terminations Station sites. Soil surveys for the existing substation facilities (Coopers Mills, Crowley's, Larrabee Road, Maine Yankee, Surowiec, and Raven Farm) were not completed because all upgrades will be located within the existing fence lines.

Reports and mapping in accordance with the standards of the Maine Association of Professional Soil Scientists and the Maine Site Law.

4.2.4.1 Merrill Road Converter Station

A Class B high intensity soil survey was conducted at the proposed Merrill Road Converter Station on June 2 and 14, 2017. The soil report indicated that the parcel is bedrock controlled. Four different soil series were identified on the parcel: Peru, Tunbridge, Lyman, and Brayton. Brayton soils are considered hydric, while Peru, Tunbridge, and Lyman are non-hydric.

4.2.4.2 Fickett Road Substation

A Class B high intensity soil survey was conducted at the proposed Fickett Road Substation on June 2 and 14, 2017. Three soil series were identified on the parcel: Peru, Lamoine, and Scantic. Peru soils are generally classified as non-hydric, while Lamoine and Scantic are hydric soils.

4.2.4.3 Moxie Gore and West Forks Termination Stations

A Class B high intensity soil survey was conducted by Robert Vile Soil Consulting within a 5 +/- acre area at both the proposed Moxie Gore and West Forks termination stations on October 12 and 13, 2018. In addition, CMP evaluated the local geology to evaluate the feasibility of HDD at this location. Soils information and a discussion of the local geology are provided below.

The soil report for the Moxie Gore Termination Station identified two different soil series within the survey area: Peru and Brayton Series. Brayton soils are considered hydric, while Peru are non-hydric. The Brayton soils were identified within a wetland area that is outside of the HDD and termination station project modification area.

The soil report for the West Forks Termination Station identified three different soil series on the parcel: Tunbridge, Lyman, and Brayton. Brayton soils are considered hydric, while Tunbridge and Lyman are non-hydric. The Brayton soils were identified within a wetland area that is outside of the HDD and termination station project modification area.

CMP's consultant, TRC, evaluated the local geology and the general risks and challenges of HDD in the context of the Upper Kennebec River compared to other location. TRC concluded that based on the review of the available information regarding the geology of the Upper Kennebec River crossing site, HDD is a feasible technology for the installation of the power transmission lines under the river.

4.3 Description of Vegetated Rights-of-Way

CMP's VCP and VMP are consistent with techniques promoted as part of a Memorandum of Understanding (2016)[18] between the USEPA, Edison Electric Institute, USDA (specifically, the Forest Service), and the U.S. Department of the Interior (specifically, the Bureau of Land Management, USFWS, and NPS). Integrated vegetation management ("IVM") practices have been adopted by federal agencies as the best practices standard within utility ROWs. IVM promotes the development of early successional growth and resists the growth of vegetation into taller strata (trees) through the application of environmentally friendly manual, mechanical, and chemical treatments on a four-year maintenance cycle. Note that herbicides will not be used in Segment 1 of the Project. IVM is recognized as a practice that reduces impacts on land, water, habitat and wildlife while meeting the goals of providing reliable and safe electrical service.

[18] EPA et al. 2016. Memorandum of Understanding on Vegetation Management for Powerline Rights-of-Way. 14pp.

According to the EPA,[19] "the IVM approach can create natural, diverse, and sustaining ecosystems, such as a meadow transition habitat. These transition landscapes, in turn, reduce wildlife habitat fragmentation and allow species to be geographically diverse, remaining in areas from which they might otherwise be excluded. A variety of wildlife species (including threatened and endangered species) consider these habitats home, such as butterflies, songbirds, small mammals, and deer. These habitats also encourage the growth of native plant species and can increase plant diversity." IVM optimizes wildlife habitat potential and produces a soft edge effect which lessens the impact of fragmentation.[20]

The majority of the Project ROW will be managed in an early successional growth pattern with a few exceptions where taller vegetation will be maintained to address rare, threatened or endangered species, habitat fragmentation, and visual impact concerns.

4.4 Wetlands and Watercourses

The Project will impact various wetlands and watercourses. CMP completed a natural resources field survey to delineate and obtain detailed, accurate information on all onsite wetlands and watercourses regulated by the USACE under Section 404 of the CWA, and by the MDEP under the NRPA, 38 M.R.S. §§ 480-A et seq.

4.4.1 Wetlands

Federal jurisdictional wetland delineations were completed in accordance with the 1987 USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (2011). In addition, several portions of the Project had been previously delineated. In these areas, the USACE and the MDEP approved of a field verification procedure.

Field work was conducted during the 2015, 2016, 2017 and 2018 growing seasons. All wetlands were classified in the field using the USFW's classification system (Cowardin et al. 1979). Wetlands delineated were classified as palustrine forested ("PFO"), palustrine scrub-shrub ("PSS"), palustrine emergent ("PEM"), palustrine open water ("POW"), and palustrine unconsolidated bottom ("PUB"). Wetlands within the existing, developed portions of the transmission line ROWs are predominantly PEM or PSS wetlands. PFO wetlands predominate along the margins of the existing developed ROWs and within the new corridor (Segment 1) portion of the Project.

[19] https://www.epa.gov/pesp/benefits-integrated-vegetation-management-ivm-rights-way#benefit
[20] Bramble, W.C., and W.R. Byrnes. 1996. Integrated vegetation management of an electric utility right-of-way ecosystem. Down to Earth 51(1):29–34.

There are a variety of wetland types across the Project; however, the IVM practices implemented by CMP to maintain vertical and horizontal line clearances within its transmission line corridors results in wetlands typically being comprised of low growing plants including shrub and herbaceous species.

A total of 1,419 federal jurisdictional wetlands were identified in the Project area including both the transmission line ROWs and substation development sites. Wetlands identified in the Project area are summarized in the Wetland Summary Table included in Attachment B. The Wetland Delineation Report and Wetland Functions and Values Assessment, are included in Attachment H and I.

4.4.2 Watercourses

The NECEC Project is located within six different watersheds as defined by the United States Geological Survey ("USGS") at the 8-digit hydrologic unit code or sub-basin level. This includes the Upper Kennebec, Dead, St. George-Sheepscot, Presumpscot, Lower Kennebec and Lower Androscoggin watersheds. The Project crosses a number of rivers and streams, none of which are designated as a National Wild and Scenic River under the National Wild and Scenic Rivers Act (16 U.S.C. 1271-1287). In addition, none of the rivers crossed by the transmission line components of the Project are considered navigable, pursuant to Section 10 of the Rivers and Harbors Act, at the crossing location.

Natural resource surveys identified 743 waterbodies as being intersected by the NECEC transmission line corridor, the majority of which are currently spanned by existing transmission lines. Of those 743 waterbodies, 224 will spanned by construction access roads. The Fickett Road Substation, Merrill Road Converter Station, West Forks and Moxie Gore Termination Stations and the substation upgrades will not impact waterbodies.

Major and minor waterbodies, including both perennial and intermittent streams, are identified in the NECEC Waterbody Table ("waterbody table") in Attachment B and depicted on the Natural Resource Maps in Attachment A. The waterbody table includes detailed segment-specific information for each waterbody within the NECEC transmission line corridors, including: stream name, average width, water quality classifications, width of the existing maintained corridor, width of additional proposed clearing, distance to new structure (pole) locations, and whether a temporary equipment crossing is proposed.

Water quality classifications were derived using The Bureau of Land Resources and Water Quality Waterbody Statutory Classification dataset (http://www.maine.gov/dep/gis/datamaps/). Classifications provided are limited to waterbodies where such geospatial information was available, largely major rivers and their tributaries. Water quality classifications for smaller perennial and intermittent streams, over much of the Project, are not provided, as

data are not readily available. The NECEC Project will not degrade water quality within any waterbody, and will not violate any state water quality law, including those governing the classification of the State's waters, even with the most stringent standards applied (i.e., Class AA). There is no in-stream construction proposed and all temporary crossings will completely span each stream and will be constructed and maintained in a manner that will prevent sediment from entering waterbodies. Additionally, CMP will follow its Environmental Guidelines, which contain effective and proven erosion and sedimentation control BMPs that will be used to protect soil and water resources during construction of the various NECEC Project components. CMP will also implement its Environmental Control Requirements, which establishes minimum requirements for effective spill prevention and response.

The most recognized species comprising coldwater fisheries are members of the family Salmonidae (trout and salmon). The most common coldwater species that occur in the Project area is brook trout (*Salve Linus fontinalis*). The MDIFW provided geospatial information which identifies certain waterbodies as "likely brook trout habitat." Brook trout are essentially pervasive in the Project area and may be found in some portion of many of the waterbodies. The brook trout populations in some of these streams are natural and self-supporting, particularly those associated with the smaller, colder streams that are sustained by groundwater input. Multiple water bodies intersected by the transmission line corridors along the Project are considered actual or potential habitat for federally endangered Atlantic salmon (*Salmo salar*). Atlantic salmon are discussed in more detail in Sections 4.7.3.2 and 7.7.2.

Species that comprise warmwater fisheries include smallmouth bass (*Micropterous dolomieu*), chain pickerel (*Esox niger*), and sunfish (*Lepomis spp.*). These waterbodies have not been studied because there has been low priority for extending research to the large number of minor waterbodies in Maine considering the abundance of larger and more significant streams and lakes. Some of these minor waterbodies classified as "N/A" are likely to support brook trout, albeit in small and/or seasonal populations. Intermittent waterbodies may provide only short-term fishery habitat value, if any.

4.4.3 Vernal Pools

During the spring months of 2015, 2016, and 2017, vernal pool field surveys were conducted in the Project area. The surveys were conducted per the MDEP Recommended Periods for Vernal Pool Egg Mass Survey by Geographic Region[21] and under the appropriate conditions for such survey efforts. The specific objectives of the vernal pool surveys were to:

[21] https://www.maine.gov/dep/land/nrpa/vernalpools/timing.pdf

1. Identify pools within the proposed transmission line corridor;
2. Determine if pools were being used by breeding amphibians;
3. Determine if any of the pools meet the definition of vernal pools under USACE guidance; and
4. Determine if any of the pools meet the necessary criteria for designation as significant vernal pool habitat in accordance with the NRPA Chapter 335.

Vernal pools were identified by assessing the physical characteristics and position in the landscape of potential vernal pools and presence or evidence of obligate or facultative species. Indicators of vernal pools include water filled depressions or evidence of temporary flooding, pit and mound topography, finger nail clams, caddisfly casings, amphibian egg masses or larvae and fairy shrimp.

As a result of the field surveys, 762 vernal pools were identified within and adjacent to the full width of the NECEC transmission line corridors and substation development footprints. For the purposes of determining impacts and compensation (see Sections 7.4.3 and 9.0 for more detail) vernal pools were split into two categories, Significant Vernal Pools ("SVP"), regulated by both the MDEP and the USACE, and USACE-only jurisdictional vernal pools. Of the 762 vernal pools identified during the field surveys, 62 were determined to be SVPs and 700 were determined to be USACE-only jurisdictional vernal pools.

These vernal pools are identified in Exhibit B-3 and B-4 of Attachment B, and are illustrated on the natural resource maps included in Attachment A.

4.5 Floodplains

Flood zone determinations were derived from Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") data. The NECEC intersects several 100-year flood plains; permanent impacts to these zones may include structure (pole) installations and substation yards. The new Merrill Road Converter Station and the existing Larrabee Road Substation are located in areas of minimal flood hazard.

FEMA and Maine flood hazard maps were obtained where available; however, certain portions of the Project are located in unmapped areas. Based on available data, flood plains intersected by the Project are listed in Table 4-1 below.

Table 4-1 Mapped Floodplains

FIRM Flood Area ID	Flood Zone	Town	Waterbody Name
23001C_1006	A	Leeds	n/a
23001C_1031	A	Livermore Falls	Scott Brook
23001C_1033	A	Livermore Falls	Trib. to Androscoggin River
23001C_1038	AE	Livermore Falls	Hunton Brook
23001C_1039	AE	Livermore Falls	Unnamed
23001C_1040	AE	Livermore Falls	Trib. to Androscoggin River
23001C_1041	A	Livermore Falls	Trib. to Androscoggin River
23001C_1042	AE	Livermore Falls	Trib. to Androscoggin River
23001C_1357	AE	Leeds	Allen Stream
23001C_1360	AE	Leeds	Trib. to Allen Stream
23001C_1529	AE	Livermore Falls	Clay Brook/Redwater Brook
23001C_732	AE	Leeds	Trib. to Allen Stream
23001C_735	AE	Leeds	Trib. to Allen Stream
23001C_753	A	Livermore Falls	Trib. to Androscoggin River
23001C_790	AE	Livermore Falls	Clay Brook/Redwater Brook
23001C_791	AE	Livermore Falls	Clay Brook/Redwater Brook Floodway
23001C_792	AE	Livermore Falls	Clay Brook/ Redwater Brook
23001C_793	A	Livermore Falls	Clay Brook/ Redwater Brook
23001C_796	AE	Leeds	Dead River
23001C_796	AE	Leeds	Trib. to Allen Stream

4.6 Groundwater Resources

4.6.1 Transmission Lines

Existing hydrogeologic conditions along the NECEC Project's transmission line route have been assessed by review of digital geographic data provided by the Maine Office of Geographic Information Systems ("MEGIS"). Digital datasets were utilized to create a site-specific map to facilitate the review of hydrogeologic conditions. A digital dataset containing location of significant sand and gravel aquifers was derived from aquifer boundaries delineated and digitized by the Maine Geological Survey ("MGS"). Significant aquifers are defined as bodies of coarse grained glacial material with the potential to yield 10 or more gallons-per-minute ("gpm") to a properly constructed well (MEGIS 2017). According to these data, the NECEC Project's transmission line traverses 30 significant sand and gravel aquifers (see Attachment A). For the reasons described in Section 7.6.2, and utilizing the protection measures described in Section 7.6.3, the transmission line construction and maintenance will not pose an unreasonable risk of a discharge to these aquifers.

4.6.2 Substations

The proposed Fickett Road Substation, Merrill Road Converter Station, and West Forks and Moxie Gore Termination Stations and associated HDD development area are not located in sole source aquifer areas or over significant sand and gravel aquifers.

Existing substations affected by the NECEC Project include Crowley's, Coopers Mills, Larrabee Road, Maine Yankee, Raven Farm, and Surowiec substations. None of these facilities are located in sole source aquifer areas. Larrabee Road Substation is located over a sand and gravel aquifer. Water quality issues relevant to substation construction and maintenance are similar to those for transmission lines; these issues, including the development and implementation of Spill Prevention, Control, and Countermeasure ("SPCC") plans, if needed, are addressed as described in Sections 7.6.3. Therefore, the construction and operation of these facilities will not pose an unreasonable risk of a discharge to a groundwater aquifer.

4.7 Protected Species

4.7.1 Introduction

The purpose of this section is to describe the protected species associated with the Project. CMP conducted resource surveys and verifications of natural resources surveys previously conducted by CMP, in 2015, 2016, and 2017. Field crews documented wildlife while conducting field surveys and verifications. CMP also conducted wildlife and fishery database searches and agency consultation with the MDIFW and the USFWS. The results of these efforts are summarized below.

4.7.2 Agency Correspondence

CMP contacted the USFWS to obtain existing data on protected wildlife and fisheries resources near the NECEC Project components. The USFWS Official Species List obtained through the ECOS-IPaC website[22] fulfills the requirement for federal agencies to "request of the Secretary of the Interior whether any species which is listed or proposed to be listed may be present in the area of the proposed action, under 7(c) of the ESA, as amended (16 U.S.C. §§ 1531 et seq.).

The Official Species List, originally generated on May 9, 2017 and updated on May 29, 2019, did not identify any candidate or proposed species or proposed critical habitats as occurring within the boundary of the proposed action or potentially affected by the proposed action. The Official Species List identifies

[22] https://ecos.fws.gov/ipac/

four (4) threatened or endangered species that may be present in the area of the proposed action, as follows:

- Small Whorled Pogonia (*Isotria medeoloides*) – Threatened
- Atlantic Salmon (*Salmo solar*) – Endangered
- Canada Lynx (*Lynx canadensis*) – Threatened
- Northern Long Eared Bat (*Myotis septentrionalis*) – Threatened

The list also identifies two (2) final designated, critical habitats:

- Critical Habitat for the Atlantic Salmon (*Salmo solar*)
- Critical Habitat for the Canada Lynx (*Lynx canadensis*)

In addition, bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), which are protected from take under the Bald and Golden Eagle Protection Act, are known to occur in Maine.

Prior to filing applications for approval under the Maine Site Law and NRPA (September 2017), CMP consulted several times with the USFWS regarding federally listed species and their designated critical habitats. Additionally, CMP, USFWS, USACE, and USDOE held a *NECEC Project Update and Section 7 Process Meeting* on June 1, 2018 to discuss the requirements of a Biological Assessment ("BA"). In that meeting the USACE asked the Applicant to assist it in providing a draft of the BA, which would be submitted by the USACE to the USFWS.

CMP also consulted with the MDIFW central office and regional biologists, and the Maine Natural Areas Program ("MNAP"), and participated in consultation meetings held jointly with multiple resource agencies, for those species that are also state listed under the Maine Endangered Species Act ("MESA"). Those resource agencies provided relevant occurrence data previously gathered through research initiatives or permit applicant-funded studies. Copies of correspondence with state and federal agencies and associated meeting notes are located in Attachment J.

4.7.3 RTE Wildlife and Species of Special Concern

The following sections identify and describe rare, threatened, and endangered species and species of special concern (collectively, "RTE" or "RTE species") that may potentially occur in the vicinity of the NECEC Project components. Data from the MDIFW and USFWS indicate that the following state and federally listed species, as summarized in Table 4-2, may potentially occur in the vicinity of the NECEC Project.

Table 4-2: RTE Wildlife and Species of Special Concern Summary Table

Common Name	Scientific Name	Federal / State Protection
Small whorled pogonia	*Isotria medeoloides*	Federal Threatened State Endangered
Canada lynx	*Felis lynx*	Federal Threatened State Special Concern
Atlantic salmon (See 7.5.2.2)	*Salmo salar*	Federal Endangered
Northern long-eared bat	*Myotis septentrionalis*	Federal Threatened State Endangered
Little brown bat	*M. lucifugus*	State Endangered
Eastern small-footed bat	*M. leibii*	State Threatened
Big brown bat	*Eptescicus fuscus*),	State Special Concern
Red bat	*Lasiurus borealis*	State Special Concern
Hoary Bat	*Lasiurus cinereus*	State Special Concern
Silver haired bat	*Lasionycteris noctivagans*	State Special Concern
Tri-colored bat	*Perimyotis subflavus*	State Special Concern
Bald eagle	*Haliaeetus leucocephalus*	Bald and Golden Eagle Protection Act
Golden eagle	*Aquila chrysaetos*	Bald and Golden Eagle Protection Act
Northern bog lemming	*Synaptomys borealis*	State Threatened
Roaring brook mayfly	*Epeorus frisoni*	State Threatened
Northern spring salamander	*Gyrinophilus porphyriticus*	State Special Concern
Bicknell's thrush	*Catharus bicknelli*	State Special Concern
Rusty blackbird	*Euphagus carolinus*	State Special Concern
Great blue heron	*Ardea Herodias*	State Special Concern
Wood turtle	*Glyptemys insculpta*	State Special Concern
Scarlet bluet	*Enallagma pictum*	State Special Concern
Brook floater	*Alasmidonta varicosa*	State Threatened
Tidewater mucket	*Leptodea ochracea*	State Threatened
Yellow lampmussel	*Lampsilis cariosa*	State Threatened
Creeper	*Strophitus undulatus*	State Special Concern

Under the MESA, the categories "endangered" and "threatened" are protected. Species of "special concern" and "extirpated" are other administrative categories established by policy, not by regulation, and are for planning and informational purposes. For the purposes of this CWA Section 404 application, the preferred habitat and

documented occurrence information for only those species that are federally protected, as they may occur along the NECEC Project, are described below.

4.7.3.1 Small Whorled Pogonia

Numerous plant species in Maine are considered rare, threatened, or endangered ("RTE"), and are protected under the ESA and/or the MNAP through statute (12 M.R.S. §§ 544, 544-B & 544- C). The Official Species List, obtained through the ECOS-IPaC website, identifies the small whorled pogonia (federally threatened) and its possible presence within the boundaries of the NECEC Project.

Small-whorled pogonia is a long-lived, perennial orchid, having an appearance similar to Indian cucumber, with a fleshy, glabrous stem, approximately 10 to 15 inches tall and with typically 5 (though possibly also 4 or 6) elliptical leaves arranged in a pseudo whorl at the top of the stem. Flowering individuals have a single (rarely two) pale, greenish-yellow flower on a very short stalk arising from the center of the leaf whorl. It occurs in mid-successional forests, often with little groundcover, and often in areas near small seasonal streams on soil with a hardpan layer. It has been documented in five counties in Maine: Androscoggin, Cumberland, Kennebec, Oxford, and York (MNAP 2018b).

As further discussed in Section 7.7.1 and in the NECEC Rare Plants Survey Narrative Report (Attachment K), CMP conducted targeted surveys for the small whorled pogonia on Segment 3, between Jay and Lewiston, where MNAP modeling results predicted the potential presence of this species. Surveys were conducted in July 2018 utilizing the survey protocol provided by MNAP. A single non-flowering, but quite robust individual was identified within the targeted search area. The occurrence was located west of the south end of Allen Pond, in Greene, approximately 87 feet west of the existing transmission line clearing.

4.7.3.2 Atlantic Salmon

The Atlantic salmon is federally listed as Endangered and there is a final Critical Habitat designation for this species, known as The Gulf of Maine Distinct Population Segment ("DPS"). The Atlantic salmon (Salmo salar) is an anadromous fish in Maine which was once present in most major rivers north of the Hudson River. Remnant populations are now known in a limited number of rivers across the state of Maine. Atlantic salmon typically spend two to three years in freshwater and then migrate to the ocean where they spend an additional two to three years before returning to their natal river to spawn. While at sea the salmon grow very quickly. Those that return to spawn after one year at sea are called grilse, whereas those that return after two or more years are called salmon. After spawning in the fall, the spent adults (known as kelts or black salmon) may overwinter in the river or return immediately to sea.

All waters currently or historically accessible to Atlantic salmon in New England have been designated as essential fish habitat ("EFH") for Atlantic salmon. The Atlantic salmon Gulf of Maine DPS of Atlantic salmon is jointly listed by the USFWS and NMFS, however the USFWS has lead agency status for ESA Section 7 consultations for those programs that occur within the freshwater habitat of Atlantic salmon.

The Gulf of Maine DPS encompasses all naturally reproducing remnant populations of Atlantic salmon in a geographic range that extends from the Androscoggin River northward along the coast, to the mouth of the St. Croix River. The Penobscot River and its tributaries downstream from the site of the Bangor Dam are included in the range of the Gulf of Maine DPS. To date, USFWS and NMFS have determined that these populations are found in the following watersheds:

- Sheepscot River watershed
- Ducktrap River watershed
- Cove Brook watershed
- Narraguagus River watershed
- Pleasant River watershed
- Machias River watershed
- East Machias River watershed
- Dennys River Watershed
- Penobscot River
- Androscoggin River
- Kennebec River

Through a review of the National Oceanic and Atmospheric Administration ("NOAA") Fisheries Atlantic Salmon Critical Habitat GIS Data Layer and the Maine Department of Marine Resources ("ME DMR") - Maine Office of GIS Data Layer ("ME GIS")-Atlantic Salmon Habitat (ASHAB3) (4/15/2016), multiple water bodies intersected by the transmission line corridors along the NECEC Transmission Project are considered actual or potential habitat for Atlantic salmon, primarily located in Segments 3, 4 and 5. No waterbodies in Segment 2 and only six waterbodies in Segment 1 of the Project are located in designated critical habitat and none of the six has been identified as Atlantic salmon habitat by ME DMR.

Approximately 32% of the 743 waterbodies intersected by the transmission line corridors along the Project have been identified as potential or known Atlantic salmon habitat. The Project crosses a total of

575 waterbodies located within the DPS, of which 238 are within designated critical habitat. The NECEC Project corridor encounters the following designated Atlantic salmon watersheds: Upper and Lower Kennebec, St. George/Sheepscot, and the Lower Androscoggin. Smaller rivers identified as being potential habitat of the Atlantic salmon include: the West Branch of the Sheepscot River and the Sandy River, a drainage to the Lower Kennebec. In addition, it is likely that many perennial tributaries to these rivers contain suitable Atlantic salmon habitat.

The NECEC Waterbody Crossing Table, included in Attachment B, provides a comprehensive list and information regarding the water bodies intersected by the Project, including whether they are located within the Gulf of Maine DPS Critical Habitat, or represent potential or actual habitat for Atlantic salmon as surveyed by ME DMR.

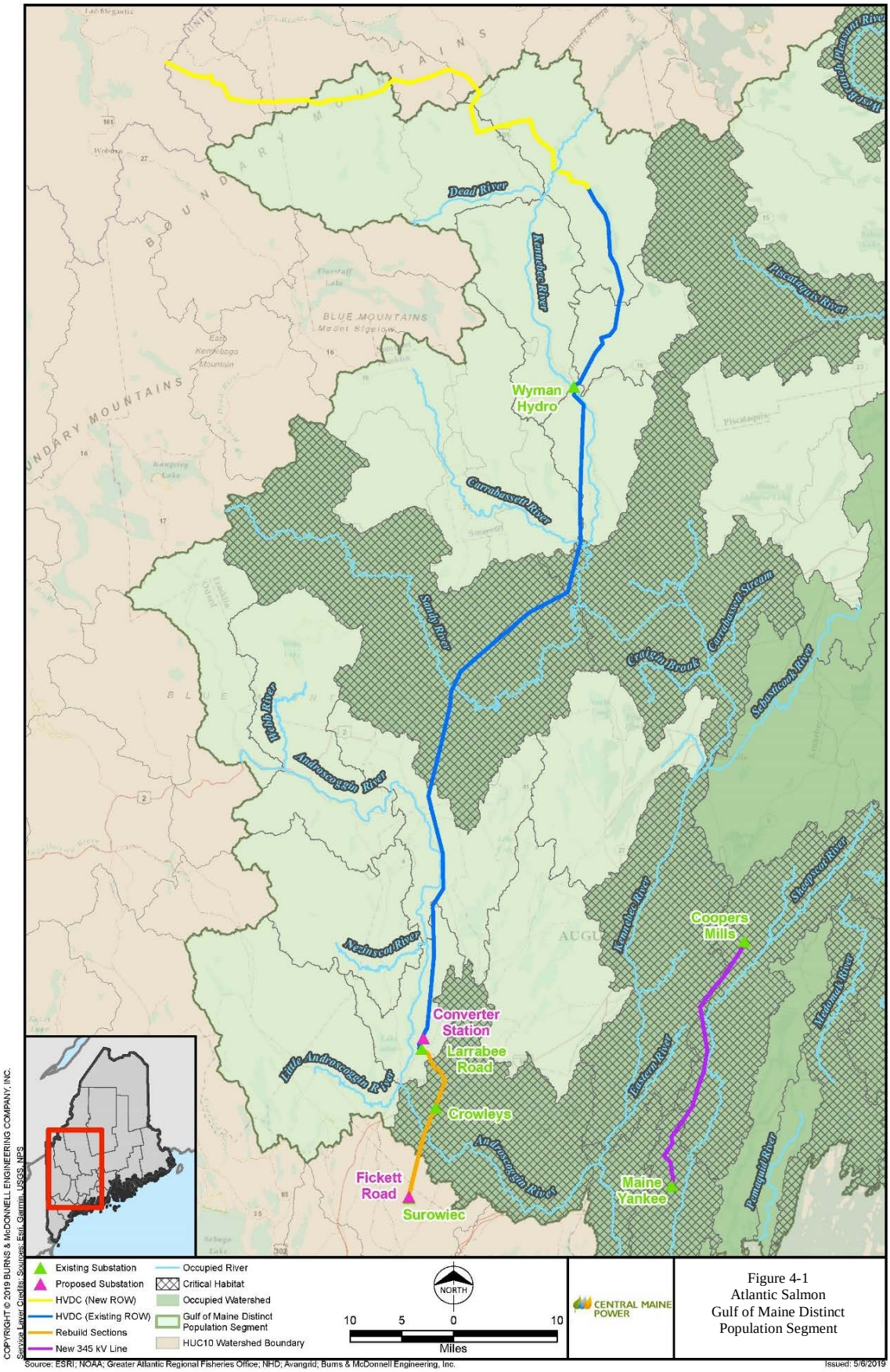


Figure 4-1
Atlantic Salmon
Gulf of Maine Distinct
Population Segment

4.7.3.3 Canada Lynx

Canada lynx are common throughout the boreal forests of Alaska and Canada and the southern portion of their range once extended into the United States Rocky Mountains, Great Lakes states, and the northeast U.S. Breeding populations are strongly correlated to the abundance of snowshoe hare (*Lepus americanus*), their primary food source. Dense conifer forest understory in a regenerating sapling spruce-fir forest (15-35 years old) is preferred by both the snowshoe hare and the lynx. Today, resident breeding populations of lynx are found in Maine.

The Canada lynx was listed in 2000 as threatened under the ESA and is also a State Species of Special Concern in Maine. The Canada lynx in the contiguous U.S. was designated a DPS, qualifying portions of northern Maine, northeastern Minnesota, northwestern Montana/northern Idaho, and north-central Washington, as federally listed critical habitat under the ESA. Critical habitat is defined as a specific geographic area that contains features essential to the conservation of an endangered or threatened species and may require special management and protection. Critical habitat may include areas that are not currently occupied by the species, but whose protection is essential to the species recovery. Canada lynx habitat covers northwestern portions of the State of Maine and includes Aroostook and Piscataquis counties and northern Penobscot, Somerset, and Franklin counties, where snow depths are highest in the state (MDIFW 2017). The NECEC Project corridor enters the Canada lynx critical habitat at the southern border of Johnson Mountain Township., extending to the Canadian border in Beattie Township. Based on information provided by MDIFW, documented occurrences of the Canada lynx have been reported near the Project corridor. Additionally, during an interagency meeting held with the Applicant on June 7, 2017, the USFWS requested the Project review also include an expanded review area extending south into Segment 3 of the Project to a point near Town Road in Embden. Figure 4-2 depicts the limits of the critical habitat and the expanded Section 7 Review Area in relation to the NECEC transmission corridor (USFWS Shapefile 2017).

A January 11, 2018 news release by the U.S. Fish & Wildlife Service states that the agency “is announcing the completion of a scientific review of the Canada lynx in the contiguous United States. The review concludes that the Canada lynx may no longer warrant protection under the ESA and should be considered for delisting due to recovery.” The news release goes on to say that the “recommendations does not remove or negate the ESA protection currently in place for the Canada lynx. To delist a species, the Service must follow a process similar to what is used in considering whether to list a species. The next step is for the Service to publish a proposed rule in the Federal Register, receive public comment,

review and analyze those comments, conduct a peer review, and then announce a final decision." (USFWS, Jan. 2018)

Thus, the Canada lynx remains federally threatened under the ESA. Consultation with USFWS and MDIFW has supported CMP's efforts to assess the presence of the Canada lynx within the Project area and to develop a plan to avoid and minimize impacts during construction.

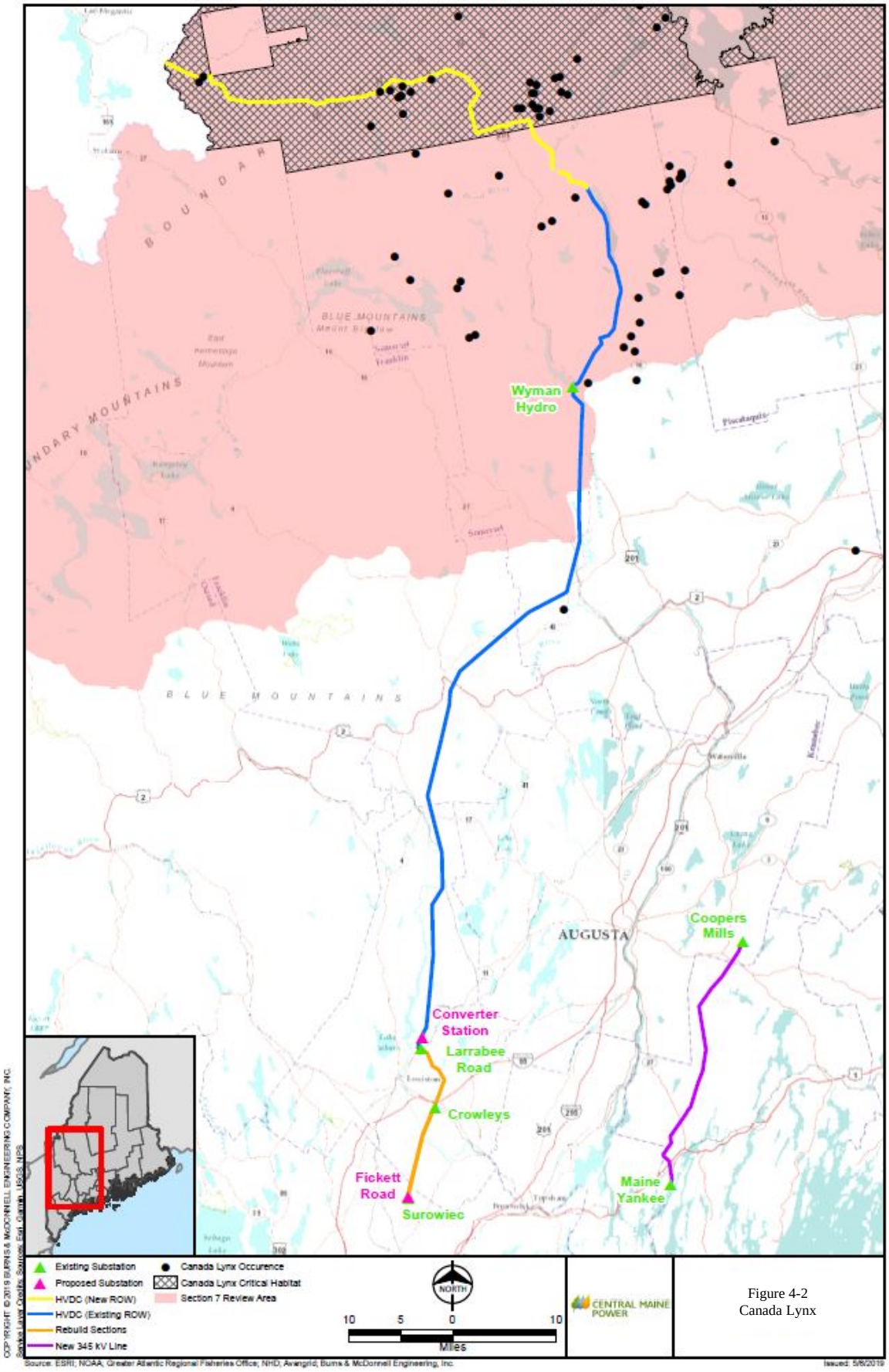


Figure 4-2
Canada Lynx

4.7.3.4 Northern Long Eared Bat

Of the eight species of myotis bats that occur in Maine, only the Northern Long-eared bat ("NLEB") is listed as threatened under the ESA. The overarching threat to the listed species of myotis bats is the invasive fungus that is the causal agent for the White-Nose Syndrome ("WNS"), which is known to predominantly affect hibernating bats.

Because of the rapid population decline due to WNS, this species was federally listed as threatened in 2015. Section 4(d) of the ESA ("4(d) rule") was finalized in January of 2016. The 4(d) rule, while it does not designate a critical habitat, prohibits "purposeful take," unless authorized by a permit, except under specific circumstances. "Take" is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." "Purposeful take" is when the reason for some activity or action is to conduct some form of take. "Incidental take" is take that is incidental to, and not the purpose of an otherwise lawful activity. The White Nose Syndrome Zone ("WNSZ"), established by the Final 4(d) Rule, includes the entire State of Maine and most areas of the eastern and midwestern United States. Inside the WNSZ, which includes the NECEC, all "take" within known hibernacula is prohibited and incidental take caused by tree removal is prohibited (without a permit) if: the tree removal occurs within ¼ mile of a known hibernacula at any time of year and tree removal cuts or destroys a known occupied maternity roost tree or any other trees within a 150-foot radius of the maternity roost tree during pup-season (June 1 through July 31) (81 FR 1900, January 14, 2016).

NLEB is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to southern Northwest Territory and eastern British Columbia. This species hibernates during the winter in caves and mines called hibernacula. In the spring and summer, they are forest-dwelling and roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Breeding begins in late summer or early fall when males swarm the hibernacula. After a hibernation period, females establish "maternity roost" trees in the spring and pups are generally born between late May and late July (USFWS 2017). According to Cory Mosby, MDIFW Furbearer and Small Mammal Biologist, there are three known hibernacula sites in the State of Maine; two in Oxford County and one in Piscataquis County, all well outside of the Project area. MDIFW reported that the only known maternity roost trees for the NLEB in Maine are located on Mount Desert Island within Acadia National Park in Hancock County (Mosby, C., personal communication, July 18, 2017). There is presumed occurrence of roosting bats in the northern hardwood and conifer forests consistent with areas found along the NECEC route.

4.7.3.5 Bald and Golden Eagles

Both bald and golden eagles are protected from take under the Bald and Golden Eagle Act.

The bald eagle was previously listed as a threatened species under the Maine ESA. Bald eagles continue to thrive in Maine with over 600 nesting pairs. Maine's bald eagle population has seen annual increases of 8 percent each year since 1990, when Essential Habitat regulations were adopted (MDIFW 2004). Known nesting sites were previously designated as "Essential Habitat" and included an area within 0.25-mile of a nest. Due to the successful recovery of the bald eagle population, effective December 5, 2009, the MDIFW adopted a rule deleting all previously designated Essential Habitats for bald eagles, as they have been removed from the State's Endangered and Threatened Species List by the State legislature and; as such, designated nest sites no longer meet the criteria for essential habitat. Bald eagles were also removed from the federal threatened species list on August 9, 2007.

Golden eagles are listed as a state endangered species under the Maine ESA but are not a federally listed species. The availability of nesting and foraging habitat are a limiting factor for golden eagles in Maine. All but one (95%) of 22 individual nests known at Maine's 11 historic eyries were on cliff ledges or mountain outcrops (Todd 2000). Correspondence with Mark McCollough (USFWS) indicated that Golden Eagle are not known to nest within the vicinity of the Project area.

CMP requested and MDIFW provided 2018 nest point location data for eagle nest distributions for the State of Maine. This data and the potential impacts and avoidance and minimization measures for eagles is described in more detail in Section 7.7.5.

4.8 Cultural Resources

SEARCH, Inc. ("SEARCH") conducted archaeological and architectural identification surveys in order to identify and evaluate the Project's impacts to historic properties. The archaeological survey identified 29 sites within the Project's direct APE and the architectural survey identified 1,528 aboveground historic resources within the Project's direct and indirect APE. Fifteen of the archaeological sites were recommended not eligible for listing in the National Register of Historic Places (NRHP), eight are avoided by the Project, and six are recommended for a finding of No Adverse Effect. The MHPC concurred with these recommendations in a letter dated February 11, 2019. Four hundred and twenty-one above ground historic resources were listed, eligible, or recommended eligible for the NRHP either individually or as part of a district. Consultation with MHPC (see January 18, 2019 and March 26, 2019 letters) resulted in a recommendation that the Project would have an adverse effect on four of these resources. These effects will be mitigated through treatment plans being developed in consultation with MHPC, the USACE, and the NPS.

4.8.1 Introduction

Development of the NECEC Project will require approvals and permits from federal, state, and local entities. The Project will need to be reviewed under Section 106 of the NHPA (16 U.S.C. § 470-f) as a federal undertaking subject to USACE (lead federal agency) and DOE permits. Section 106 of the NHPA requires federal agencies to take into account, prior to authorizing an undertaking, the effect of that undertaking on cultural resources listed, or eligible for listing, in the NHRP (36 C.F.R. § 60). Agencies must also afford the Advisory Council on Historic Preservation the opportunity to comment on undertakings. The Section 106 process is coordinated at the state level by the State Historic Preservation Officer, represented in Maine by the MHPC.

The APE for direct and indirect Project impacts was established in consultation with the MHPC and has been used to support Section 106 consultation. The indirect APE is defined as a 0.8-kilometer (km) (0.5-mile [mi]) buffer around the Project. The direct APE was considered the entire ROW width or facility footprint where ground-disturbing activities could take place. Actual indirect and direct effects were refined following survey to consider the project design with regard to both visual and physical impacts.

4.8.1.1 Tribal Consultation

The Section 106 compliance process requires that the lead federal agency conduct consultation with federally recognized tribes that may have an interest in the Project. CMP began coordinating with the Tribal Historic Preservation Officers ("THPOs") of the Houlton Band of Maliseet Indians, the Passamaquoddy Tribe at Pleasant Point and Indian Township reservations, the Aroostook Band of Micmacs, and the Penobscot Nation in August 2017. This coordination was meant to allow THPOs to engage with CMP regarding their overall interest in the Project and to facilitate surveys for traditional cultural properties.

One response was received from the THPO of the Penobscot Nation on August 28, 2017, concluding that "this project appears to have no impact on a structure or site of historic, architectural or archaeological significance to the Penobscot Nation as defined by the National Historic Preservation Act of 1966, as amended." It is unlikely that these tribes will engage in formal Section 106 consultation with the USACE based on CMPs early coordination and their lack of interest in the Project to date.

In addition to tribal consultation pursuant to Section 106, CMP negotiated a lease with the Passamaquoddy Tribe (the "Tribe") for a two acre 300 foot wide by 300 foot long parcel in Lowelltown Township on Segment 1. Because this land is owned in trust by the U.S. Government for the Tribe, the lease is subject to approval by the U.S. Department of the Interior, Bureau of Indian Affairs ("BIA"). By

letter dated April 23, 2018 the Tribe submitted to BIA the executed lease (signed by both CMP and the Tribe) and supporting documentation, and requested BIA approval of the lease. BIA will consider whether it has sufficient NEPA review documentation to approve the lease when the USACE issues the Environmental Assessment.

4.8.1.2 Agency Consultation

On behalf of CMP, SEARCH coordinated with the MHPC and provided information for the Department of Energy's Presidential Permit Application regarding the proposed scope of the New England Clean Energy Connect and its impacts to historic properties. Below is a summary of coordination with these agencies undertaken in advance of the Unites States Army Corp of Engineers' (USACE) formal initiation of Section 106 consultation:

- July 2017 Summary of Impacts to Known Historic Properties submitted as part of DOE Presidential Permit Application
- September 2017 Final Desktop Sensitivity Assessment and Scope-of-Work for Archaeological and Architectural Identification Surveys submitted to MHPC
- July 2018 Consultation meeting on Identification and Finding of Effects for Above Ground Resources attended by MHPC, CMP, and SEARCH
- October 2018 Above Ground Resources Identification and Finding of Effects Report submitted to MHPC
- December 2018 Final Archaeological Resources Identification and Finding of Effects Report submitted to MHPC
- March 2019 Supplemental Report on Effects to Above Ground Properties submitted to MHPC
- May 2019 USACE Issues Additional Information Request to CMP covering materials needed for Section 106 consultation and requesting follow up meetings with stakeholders
- May/June 2019 Merrill Road Converters Station Identification and Finding of Effects for Archaeology and Above Ground Resources report and addendum submitted to MHPC
- July 2019 (planned) Section 106 consultation meeting with USACE, CMP, SEARCH, MHPC, DOE, NPS, MATC, and ATC anticipated to discuss adverse effects to historic properties, options to avoid, minimize, or mitigate these effects, and begin process of MOA negotiation.

4.8.2 Cultural Resource Surveys

4.8.2.1 Archeological Survey

A total of 4,537 shovel test (ST) locations in 203 test areas (TAs) were investigated by SEARCH to determine presence of significant archaeological sites that could be impacted by the proposed Project. The 440 positive STs excavated defined a total of 47 archaeological resources, including 29 archaeological sites and 18 isolated finds. An additional 16 previously recorded sites were identified within the NECEC Project APE were not investigated.

The 18 isolated finds consist of individual artifacts, or small numbers of related artifacts from a single ST with no nearby associated material, and are considered not eligible for NRHP listing because they have no research significance.

The 45 archaeological sites in the NECEC Project APE are summarized in Table 4-3. The 16 previously recorded sites that were not investigated include seven that were previously determined not eligible for NRHP listing, seven that were found outside the NECEC Project APE, and two that will be avoided by the Project and will not be impacted. One of these latter sites is eligible for NRHP listing, whereas the other one is potentially significant. Because these 16 previously recorded sites were not investigated for the present Project, site type and period of occupation are not included in Table 4-3.

Of the 29 sites investigated for this Project, 28 are historic and one is prehistoric. The prehistoric site, ME 38.102, consists of five pieces of Kineo-Traveler rhyolite debitage, including two that were made into expedient tools, from a single ST. Ordinarily groups of related artifacts from a single ST are considered isolated finds, but in consultation with the MHPC 38.102 is treated as a site because it may extend outside the Project ROW. Kineo-Traveler rhyolite was rarely utilized by Paleoindian groups, and ME 38.102 is dated to a post Paleoindian timeframe.

The historic sites include:

- Two agricultural outbuildings.
- Five domestic sites with evidence of residential use but no evidence of agricultural practices.
- Ten farmsteads with evidence of both a residence and agricultural use.
- Eight field scatters with historic artifacts but no evidence of a structure.
- One fish hatchery built by the State of Maine.
- One possible walkway associated with a possible fieldstone wall remnant and historic artifact scatter.

- One historic scatter associated with a domestic structure or farmstead that was not present in the Project ROW.

Historic sites recorded in the NECEC ROW date from the eighteenth century to the twentieth century based on the artifacts recovered; however, the prevalent occupation is from the mid- to late-nineteenth century through the early twentieth century. Some sites show evidence of occupation both before and after those dates, but that evidence is not extensive.

In addition to the archaeological sites and isolated finds discussed above, one previously unrecorded historic cemetery was identified adjacent to the NECEC Project APE. GPR survey within the adjacent ROW revealed the presence of four probable unmarked graves and a fifth possible unmarked grave, and prompted the establishment of an avoidance area around these features.

Table 4-3. Summary of Archaeological Sites in the Project Right-of-way, with Recommendations.

Site No.	Temp. ID	Site Type	Period of Occupation	NRHP Rec.	Treatment Rec.
ME 013-002	QMI-05-16-001	Domestic	Nineteenth and twentieth century	Additional work	Avoid
ME 013-003	QMI-05-16-002/ 004	Domestic	Nineteenth and twentieth century	Additional work	Avoid
ME 014-161	Prev. Rec	Lithic and calcined bone scatter	General prehistoric	Determined not eligible	No further consideration
ME 024-40	Prev. Rec	Buried living surface, discontinuous	Late Ceramic	Additional Work	Avoid
ME 024-41	Prev. Rec	Lithic scatter	General prehistoric	Determined not eligible	No further consideration
ME 024-42	Prev. Rec	Isolated artifact	Archaic	Determined not eligible	No further consideration
ME 024-43	Prev. Rec	Lithic scatter	General prehistoric	Determined not eligible	No further consideration
ME 036-44	Prev. Rec	Ceramic scatter	General ceramic	Not in NECEC project area	No further consideration
ME 036-50	Prev. Rec	Lithic scatter	General prehistoric	Determined not eligible	No further consideration
ME 036-51	Prev. Rec	Lithic scatter	General prehistoric	Not in NECEC project area	No further consideration
ME 036-52	Prev. Rec	Artifact scatter	General prehistoric	Not in NECEC project area	No further consideration
ME 036-53	Prev. Rec	Lithic and calcined bone scatter	General prehistoric	Not in NECEC project area	No further consideration
ME 036-54	Prev. Rec	Lithic scatter	General prehistoric	Not in NECEC project area	No further consideration
ME 051-09	Prev. Rec	Lithic scatter	General prehistoric	Not in NECEC project area	No further consideration
ME 051-10	Prev. Rec	Lithic scatter	General prehistoric	Not in NECEC project area	No further consideration
ME 131-002	Prev. Rec	Farmstead	Nineteenth century	Determined not eligible	No further consideration

Table 4-3. Summary of Archaeological Sites in the Project Right-of-way, with Recommendations.

Site No.	Temp. ID	Site Type	Period of Occupation	NRHP Rec.	Treatment Rec.
ME 131-003	Prev. Rec	Farmstead	Nineteenth century	Eligible	Avoid
ME 154-009	QMI-08-16-001	Farmstead	Nineteenth century	Additional work	Avoid
ME 154-010	QMI-08-17-001	Field scatter	Twentieth century	Not eligible	No further consideration
ME 154-011	QMI-08-17-002	Field scatter	Twentieth century	Not eligible	No further consideration
ME 154-012	QMI-08-16-002	Possible walkway	Nineteenth or twentieth century	Additional work	Avoid
ME 180-001	Prev. Rec	Domestic	Nineteenth century	Determined not eligible	No further consideration
ME 180-003	QMI-14-05-001	Agricultural Outbuilding	Nineteenth and twentieth century	Not eligible	No further consideration
ME 180-004	QMI-14-07-001	Farmstead	Nineteenth and twentieth century	Not eligible	No further consideration
ME 217-001	QMI-09-01-001	Farmstead	Nineteenth and twentieth century	Additional work	Avoid
ME 217-002	QMI-08-22-001	Domestic	Nineteenth and twentieth century	Not eligible	No further consideration
ME 217-003	QMI-08-24-001	Farmstead	Nineteenth and twentieth century	Additional work	Avoid
ME 236-012	S62/64-07-001	Historic scatter	Late eighteenth to twentieth century	Not eligible	No further consideration
ME 293-015	QMI-03-01-001	Farmstead	Late nineteenth to early twentieth century	Additional work*	Avoid
ME 293-016	QMI-03-01-002	Farmstead	Nineteenth and twentieth century	Additional work*	Avoid
ME 293-017	QMI-04-03-001	Agricultural Outbuilding	Undetermined	Not eligible	No further consideration
ME 293-018	QMI-04-04-001	Farmstead	Nineteenth and twentieth century	Not eligible	No further consideration
ME 358-008	S62/64-14-001	Farmstead	Nineteenth and twentieth century	Additional work	Avoid
ME 38.102	S11-05-03-001	Lithic scatter	Post Paleoindian	No significant deposits in APE	No further consideration
ME 414-004	QMI-06-01-001	Field scatter	Late nineteenth century	Not eligible	No further consideration
ME 431-035	QMI-02-01-001	Fish Hatchery	Twentieth century	Additional work	Avoid
ME 478-006	S11-05-03-003	Farmstead	Nineteenth century	Additional work	Avoid
ME 478-007	S11-05-05B-001	Domestic	Eighteenth and nineteenth century	Additional work	Avoid
ME 478-008	S11-05-10-001	Field scatter	Nineteenth and twentieth century	Not eligible	No further consideration
ME 478-009	S11-05-03-002	Domestic	Nineteenth century	Not eligible	No further consideration
ME 484-006	S11-05-01-001	Domestic	Late eighteenth to twentieth century	Additional work	Avoid

Table 4-3. Summary of Archaeological Sites in the Project Right-of-way, with Recommendations.

Site No.	Temp. ID	Site Type	Period of Occupation	NRHP Rec.	Treatment Rec.
ME 491-054	S11-04-01-001	Field scatter	Undetermined	Not eligible	No further consideration
ME 491-055	S11-04-02-001	Field scatter	Undetermined	Not eligible	No further consideration
ME 491-056	S11-04-03-001	Field scatter	Undetermined	Not eligible	No further consideration
ME 491-057	S29-04-03-001	Domestic	Nineteenth century	Additional work	Avoid

* Possible contributor to possible rural landscape or historic district.

4.8.2.2 Historic Architecture Survey

Between April and December 2018, SEARCH conducted historic architectural surveys and made recommendations of NRHP eligibility and a finding of effects on historic properties to support the Section 106 consultation process. MHPC approved a scope of work (SOW) for the reconnaissance survey on September 7, 2017. In April and May 2018, SEARCH conducted reconnaissance surveys to identify above ground historic resources within the indirect and direct APEs of the NECEC Project. SEARCH submitted an Above Ground Historic Resources Survey Identification Report to MHPC in August 2018. SEARCH revised the survey report, added a finding of effect, and submitted an Above Ground Historic Resources Survey and Finding of Effects Report to MHPC on October 22, 2018.

From September through November 2018, SEARCH submitted above ground resources survey forms electronically via MHPC's Cultural Architectural Resource Management Archive (CARMA) system. Upon review, MHPC requested nine additional resource survey forms. An addendum addressed those resources that were added to the Project in CARMA in December 2018.

In summary, the reconnaissance survey identified 1,552 above ground historic resources in total within the Project APE. Twenty-four of these resources were previously surveyed multiple times, bringing the total number of unique resources identified to 1,528. Of 1,528 resources:

- 1,107 resources are determined or recommended not eligible for the NRHP
- 421 resources are listed, eligible, or recommended eligible for the NRHP either individually or as part of a district:
    - 129 previously identified resources, which have been listed or determined NRHP eligible:
        - 105 resources, which compose 77 historic properties, were previously determined eligible by MHPC;

        - 24 resources, which compose nine historic properties, are listed in the NRHP.
    - 292 resources are recommended eligible for the NRHP.

The reconnaissance survey and addendum reports made NRHP recommendations for the newly identified resources. SEARCH recommended 292 resources as NRHP-eligible, and 129 resources are either listed or previously determined NRHP eligible. SEARCH submitted the following Finding of Effects on those resources listed, eligible, or recommended eligible for the NRHP either individually or as part of a district:

- Finding of Effects recommendation for the 421 historic resources:
    - 88 historic resources will be directly and indirectly affected
        - 69 historic resources will not be adversely affected
        - 19 historic resources which compose four properties will be adversely affected
            - One property is determined eligible and three are recommended eligible
    - 333 historic resources will be indirectly affected; none of these effects will be adverse.

In a letter dated January 18, 2019, MHPC concurred with SEARCH's findings, requested additional Finding of Effects for 15 resources, photo-simulations for four additional resources, and additional information regarding the Appalachian Trail. SEARCH submitted the requested information in an addendum on March 1, 2019. Of the 15 resources, SEARCH made recommendations of No Effect (9) and No Adverse Effect (6). In a letter dated March 26, 2019, MHPC concurred with SEARCH's Finding of Effects on the 15 resources and concluded the project would have an adverse effect on the Appalachian Trail.

Please see Section 7.8 for a discussion of Project impact avoidance and minimization measures for cultural resources.

4.9 Land Use and Recreation

Land uses in the vicinity of the NECEC generally include forestry, agriculture, residential / commercial / industrial, transportation, recreation, conservation, historical, and natural features such as rivers, lakes, wetlands, and wildlife habitat areas. These uses will continue largely uninterrupted during the construction, operation, and maintenance of the transmission lines and the associated facilities.

Based on local assessors' databases (MEGIS 2017), LUPC protection and development zones (MEGIS, 9/1/2015), and the National Land Cover Database 2011 (MRLC 2011), approximately 81% of the land within the Project corridor consists of forestland or open land. (Open land may be categorized as barren land, herbaceous grassland, or scrub-shrub.)

Table 4-4 Land Use Summary

Land Use	Acres	Percent Area
Forest	3109.45	47%
Open Land	2213.47	34%
Agricultural	489.79	7%
Wetlands/Open Water	428.51	7%
Developed (Res./Comm./Ind.)	267.62	4%
Public Utilities	53.96	1%
Totals	8631.39	100%

Recreational uses in the Project area includes, but are not limited to, hunting, fishing, hiking, recreational vehicle use, whitewater rafting, boating, and wildlife viewing. Land use impacts are considered under Maine's Site Law, NRPA, local municipal ordinances, and the land use certification requirements of the Maine LUPC, and further discussed in Section 7.9.

5.0 CONSTRUCTION PLAN

5.1 Introduction

The following construction plan provides an overview of the transmission line and substation construction techniques that will be implemented during construction of the NECEC Project. This plan is based on established transmission line and substation construction methods and is designed to minimize impacts to natural resources and expedite restoration after completion of construction activities. Construction will be performed in such a manner that: 1) natural resources are protected to the greatest extent practicable, 2) construction crews safely construct the transmission lines and substations, 3) erosion and sedimentation is minimized, and 4) areas temporarily disturbed by construction are restored to original contours, to the extent practicable, and permanently stabilized. Specific erosion control methods are discussed in CMP's Environmental Guidelines in Attachment E.

As a result, the Project will not unreasonably interfere with natural water flow, violate any water quality law, or unreasonably cause or increase flooding. In addition, this plan helps to ensure there will be no unreasonable harm to wildlife habitats, including fisheries.

This plan focuses on the established transmission line and substation construction methods that will be employed when traversing uplands, waterbodies, and wetlands, when clearing, and when constructing project components. This plan also provides for flexibility to allow application of the most appropriate construction methods based on site-specific conditions.

It is estimated that construction of the NECEC transmission lines and substations will take place over approximately 36 months.

5.2 Transmission Line Construction Sequence

The construction contractor will generally follow the conventional transmission line construction sequence listed below. Each item listed is independently discussed in the following subsections.

- Establish construction yards and on-site staging areas;
- Flag environmental resources and buffers;
- Complete the initial program "walk-through" with the NECEC team and construction contractor;
- Plan and install erosion and sedimentation controls and access at protected resources such as waterbodies, wetlands, areas of saturated soils, and areas susceptible to erosion;

- Establish temporary short-term (typically eighteen months or less) and temporary longer-term (typically more than eighteen months) construction access ways;
- Clear capable vegetation as necessary;
- Perform grading as necessary to accommodate construction equipment access roads;
- Move poles and materials to structure installation and laydown locations;
- Complete test digging/drilling at various pole locations;
- Install erosion and sedimentation controls at structure locations;
- Excavate structure holes;
- Install structures;
- Complete restoration and grading around the structures;
- Establish "pull-pad" locations and move tensioning and pulling equipment into place;
- Thread and install pull ropes, conductor, and fiber optic wire;
- Clip conductor and remove blocks;
- Complete the construction inspection, clean-up, and restoration, and energize the line; and
- Complete the final program "walk-through" and restoration.

5.2.1 Establishing Construction Yards and On-Site Staging Areas

The contractor will typically establish at least one principal working construction yard, office, and staging area in the vicinity of the ROW. This area is used to stage the bulk of construction materials such as poles, wire, and equipment, and is used as a central point of communication. A second yard may be established to store some materials closer to their area of application and may serve as a landing site for helicopters. Additionally, site specific staging areas will be established at strategic locations along the ROW, often where the line crosses county roads. These staging areas will be established away from protected natural resources.

5.2.2 Completing the Initial "Walk-Through"

Prior to tree clearing or construction activities, the NECEC team will walk the length of the transmission line with the contractor to identify critical areas where construction and construction access may be difficult due to terrain, wetland, and water course conditions, or the location of protected or sensitive natural resources. Erosion control placement, access road layout, wetland, and stream crossing locations will be addressed with the contractor, with avoidance and minimization of wetland and waterbody impacts a priority. The type and location of erosion controls as well as the approach to wetland and stream crossings will be confirmed at that time. Suitable access areas will be flagged with a specified

color of surveyor tape, and "no-access" areas (such as certain stream buffers) will also be marked using appropriate color-coded tape.

5.2.3 Planning the Installation of Erosion Controls and Access

Installation of erosion controls and construction of access ways will be the first tasks completed. Erosion controls and access ways will be installed in accordance with CMP's Environmental Guidelines. CMP's guidelines include detailed erosion and sedimentation control measures, resource identification procedures, access road and equipment travel impact minimization measures, and restoration and stabilization measures that will reduce potential impacts to waterbody resources.

5.2.4 Establishing Temporary Construction Access Ways

Temporary Shorter-term Access Ways (typically eighteen months or less)

Temporary access ways will be established within the ROW to provide construction equipment access to the structure locations. This will be an ongoing process as access will be established to areas undergoing immediate construction. As construction progresses, new access ways will be established and obsolete ones will be discontinued and restored as needed.

During frozen ground conditions without snow, paths will be designated and temporary bridges will be constructed to cross streams. During such conditions, access through most wetlands can be completed without the use of mats. All stream crossings will utilize construction mats. Construction mats, either timber or fiberglass composite, will also be used in areas where the ground is not sufficiently frozen to support equipment. During winter construction with snow cover, packed snow paths ("snow roads") and ice paths may be created to provide a solid surface for heavy equipment to traverse. The need for construction mats will be evaluated and discussed among CMP's environmental inspector, the Maine MDEP third party inspector, and the contractor on a location-specific basis.

During non-frozen ground conditions, construction mats will be utilized to cross wetlands with standing water and/or organic soils, as well as streams and other areas particularly susceptible to rutting and erosion. This may require extensive utilization of construction mats. There may be instances where CMP's environmental inspector, the MDEP third party inspector (if required), and the contractor conclude that construction mat installation, use, and removal would cause more disturbance than if no construction mats were used; in these cases, construction mats may not be used.

The typical use of construction mats to cross wetlands is depicted in CMP's Environmental Guidelines. Cutting of non-capable vegetation, such as shrubs, in wetlands will be limited to those areas necessary for

safe access. In these areas cutting will be selective. It is a priority to lay construction mats on top of shrub vegetation. No extensive grubbing (grading to remove root systems) within wetland crossing areas will be done prior to mat placement. However, some minor grading may be required to ensure mat stability and construction access safety. Such grading will be limited and only with prior approval by CMP's environmental inspector.

Temporary bridges will be used to cross streams regardless of site conditions. Temporary bridges can be created using construction mats, typically timber mats (See *Section 4.0 Installation of Crossings* in CMP's Environmental Guidelines). Appropriate erosion controls will be installed wherever necessary. If necessary, construction mats will be placed parallel to the upland edge as abutments to further protect stream banks and to establish stability. Streams that are too wide to cross with construction mats or temporary bridges will be avoided.

Temporary Longer-term Access Ways (typically more than eighteen months)

Construction of the NECEC is scheduled to take place over 36 months. Project construction will not require leaving longer-term access roads, including temporary bridges and construction mats, in place for longer than 18 consecutive months.

5.2.5 Clearing Canopy Vegetation and Grading

Some of the NECEC transmission line corridor will require limited additional clearing, which will be done in accordance with the NECEC VCP (Attachment E).

Danger trees will also be identified and cut down at that time. "Danger trees" are standing dead, damaged, or dying trees located adjacent to the ROW itself that, due to their location, pose a risk of contact with the transmission line. Some danger trees may be within or adjacent to protected natural resources.

Construction of the NECEC will be performed in a wide array of vegetative cover types. As in past CMP projects, the height of cover will dictate the type of structure site preparation needed. In general, vegetation less than approximately 30 inches high will require little structure site preparation. Typically, construction personnel will drive over the vegetation and perform their work. However, in wet areas where moderate to severe rutting could occur, construction mats will be needed to minimize or avoid unnecessary environmental impacts. In these areas, some vegetation treatment will be necessary in order to set the construction mats in place so that they are flat and provide a safe work platform. Vegetative treatment will remove vegetation to near ground level but will not impact the plant's roots. Vegetative

material removal may be performed using a mulching head, such as the “brontosaurus,” attached to a small, tracked, low-ground-pressure equipment, such as a Caterpillar Bobcat, or may be removed by hand, typically with a chainsaw. This approach allows for a safe work platform and is preferred because it causes less environmental damage and promotes a more rapid regrowth than uprooting woody growth by driving over it, a danger that is exacerbated by wet soils.

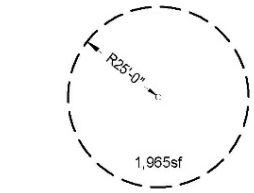
Areas that have vegetation higher than 30 inches will require structure site preparation. As described above, vegetation removal may be performed using a mulching head attached to a small, tracked, low-ground-pressure equipment, such as a Caterpillar Bobcat, or may be removed by hand, typically with a chainsaw.

The area requiring site preparation will vary by structure type. Basically, there will be five structure types used on the NECEC Project: wood H-frame, wood monopole, steel monopole, steel H-frame, and three-pole dead-end and angle structures. Figure 5-1 depicts the variations on the four structure types and the necessary structure preparation area with the respective square footage for each type. Note that the shapes depicted are representative. The contractor will be restricted to the square footage depicted but the shape may vary based on need. The designs in Figure 5-1 consider the equipment needed to perform the work. As the structure members get larger, larger equipment is needed to perform the work. Also, larger structures require greater clearances. For example, a typical wooden 115kV dead-end structure (EBR-1 on Figure 5-1) requires bucket trucks (approximately 50 feet long), cranes (approximately 40 feet long) and/or an excavator (approximately 20 feet long) for pole installation with clearance between outer conductors of 28 feet. Steel monopoles require much larger equipment and the use of concrete trucks (for pouring foundations) requiring stable roads and larger work pads.

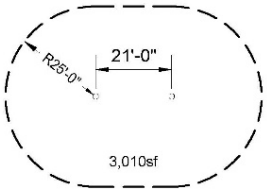
In addition to structure site preparation, vegetation removal will be required for installation of guy wires for most three-pole structures. Guy wires are used to provide additional support for the poles in high stress conditions. In most cases, the distance the guy wire anchors are set from the base of the pole is equal to the height of the lowest conductor arm above the ground surface, which typically will be approximately 60 feet. On heavy angle (greater than 75 degrees) steel monopole structures, the distance the guy wire anchors are set from the base of the pole is equal to the height of the static (topmost) wire above the ground surface, which typically will be approximately 100 to 120 feet. This additional workspace will normally only be needed on one of the two outer poles. The guy wire anchor for the remaining structures will be located in the work area prepared for the pole installation. Electric code

requires that guy wires be grounded so a narrow lane between the guy wire anchor locations will require vegetative treatment to allow for installation of the counterpoise, or grounding wire.

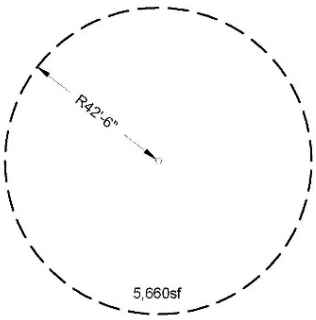
In general, extensive grading will not be necessary. Grading may be required for stabilizing access roads, excavation sites, and pull-pad sites where terrain is uneven such that construction equipment access would not be safe without grading. Conductor pull-pad setup locations may require leveling by limited grading in an approximately 175-foot by 100-foot area to assure equipment stability. These sites will typically be located in uplands; if absolutely necessary; however, sites may be set up in wetlands using construction mats.



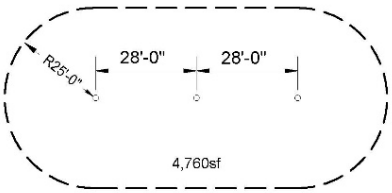
ADSS, SCB, SCC, SCDAR, SCLA, SCT
SINGLE POLE WOOD STRUCTURES



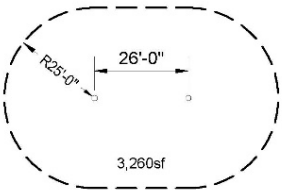
EAR-3
TWO POLE WOOD STRUCTURES



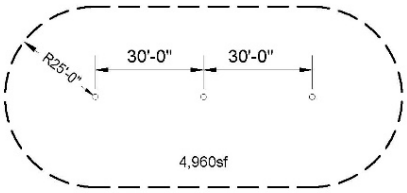
SSDE
SINGLE POLE STEEL STRUCTURES



EBR-2, EBR-3
THREE POLE WOOD STRUCTURES



EAR-1
TWO POLE WOOD STRUCTURES

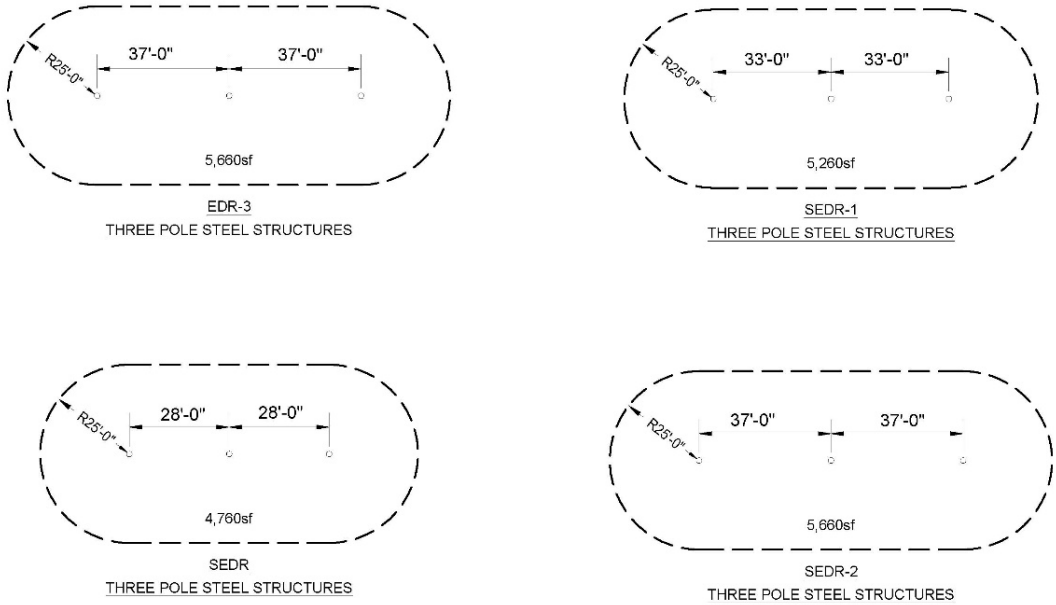


ECR-1, ECR-2
THREE POLE WOOD STRUCTURES

CENTRAL MAINE POWER COMPANY

CENTRAL MAINE POWER

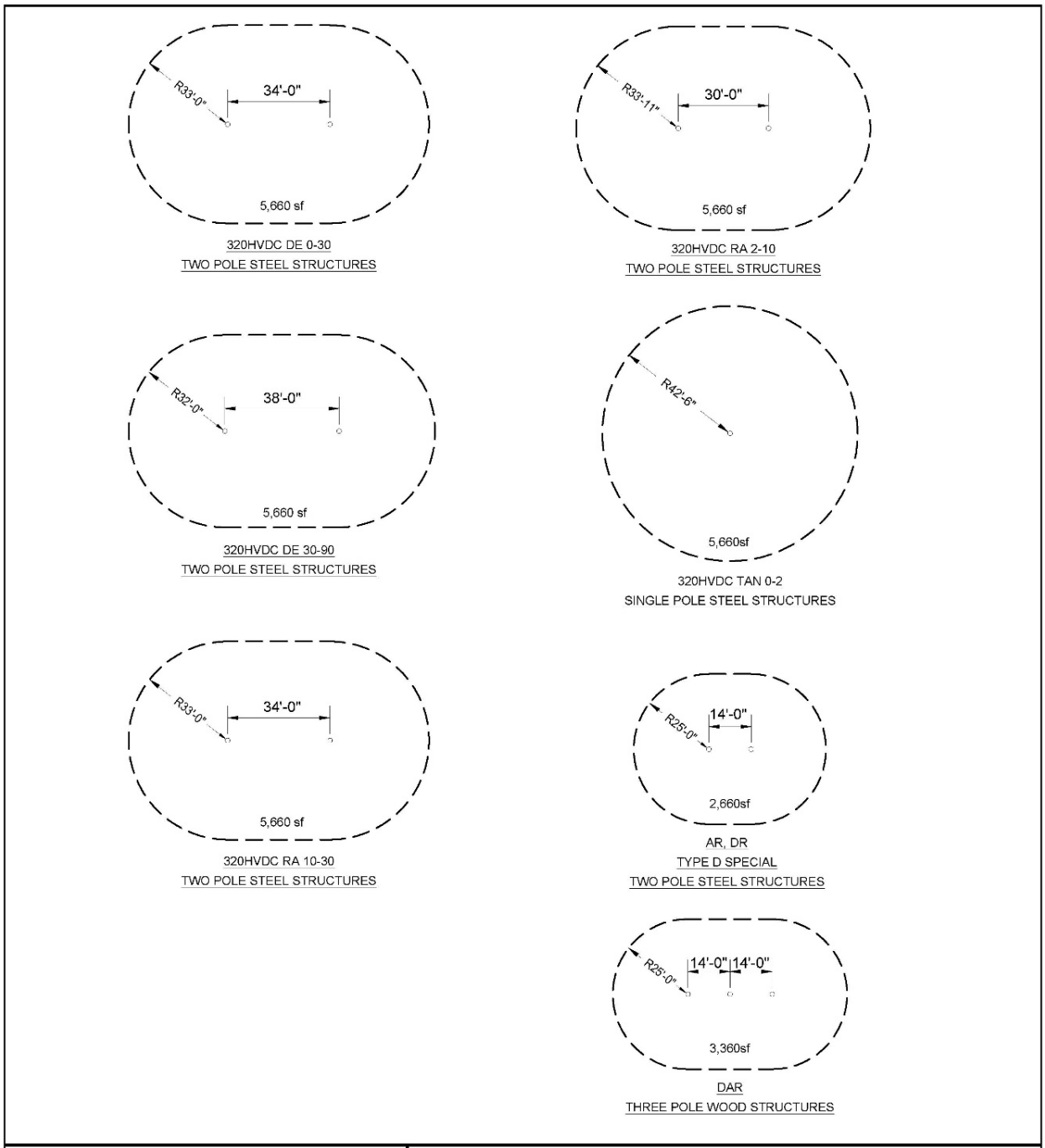
Temporary Impact Area
Figure 5-1, Page 1



CENTRAL MAINE POWER COMPANY

CENTRAL MAINE POWER

Temporary Impact Area
Figure 5-1, Page 2



CENTRAL MAINE POWER COMPANY

CENTRAL MAINE POWER

Temporary Impact Area
Figure 5-1, Page 3

5.2.6 Moving Construction Materials in Place

Poles will either be hauled in by truck or skidder or flown in via helicopter. In areas where access is suitable (*e.g.*, level uplands near roads), trucks may be used. In areas with more difficult access, skidders or forwarders may be used to bring the poles to the proposed pole locations. In very remote areas or areas with extreme terrain, or during accelerated construction, helicopter transportation may be used.

5.2.7 Completing Test Drilling

Proposed pole placement locations may be pre-dug or drilled prior to a pole setting crew mobilizing to the area in order to determine if blasting will be required to set the poles. Holes must be dug to a depth of 10 percent of the pole length plus two feet. For example, an 85- foot pole requires a hole 8.5 feet plus 2 feet deep, or 10.5 feet total in depth. Blasting may be necessary if bedrock is encountered before the required depth for the placement of a specific pole is reached.

5.2.8 Establishing Erosion Controls

As access to each structure site is completed and prior to the contractor commencing excavation, erosion controls will be installed per the direction of the environmental inspector and will adhere to standards as described in CMP's Environmental Guidelines. These controls are in addition to the controls established during the initial site walk. The locations of erosion control devices will be marked using flagging tape or spray paint.

5.2.9 Excavating Structure Holes

Excavation for the structure holes will be completed using a backhoe. The contractor has a predetermined size and depth and location for each structure. De-watering of the hole during excavation may be necessary in areas with a high-water table and will be completed in accordance with the NECEC Project Construction Dewatering Plan (Attachment E). Pole placement will permanently disturb an area ranging from 30 square feet to 195 square feet depending on the structure type required; grubbing, if needed, will temporarily disturb an additional area of approximately 60 square feet. Disturbance will be slightly greater in areas where angle poles are installed, due to the need to excavate for one or more guy wire anchors. Topsoil will be set aside for restoration and placed on the top of the spoil and spread out evenly around the base of the pole.

Although extensive blasting is not anticipated, some controlled blasting may be required if bedrock is encountered. If blasting is required, proper safeguards will be employed to protect personnel and property in the vicinity of the blasting. Blasting mats will be used to prevent shot rock from scattering. Pre-blast

surveys are typically performed to document the presence and condition of wells, personal property, and utilities in the vicinity. Blasting precautions will be the contractual responsibility of the contractor.

5.2.10 Installing Structures

Once a hole is prepared to the proper depth, a crane is used to place the pole in proper alignment. The construction crew aligns and plumbs each pole before filling the hole. The hole is filled with the spoil and is mounded up at the base of the pole and compacted. In wet areas, crushed rock is used to replace some of the soil. The spoil is removed and disposed of in an upland site, spread out, and mulched.

In areas where more than one pole is required (*e.g.*, specific transmission line designs and certain angle structures), the area of disturbance for the poles will overlap. Angle poles require guy wire anchor placement, which may slightly increase the area of disturbance around these locations.

For single pole structures, davit arms, i.e., the arms supporting insulators to which the conductor is connected, are attached before the pole is set in place. For structures with multiple poles, cross braces are hoisted into place using a crane; the braces are then affixed by workers climbing each pole. In each case, the insulators and blocks are subsequently attached.

The transmission line has been designed to site poles outside of wetlands to the maximum extent possible, but engineering limitations necessitate that some poles be placed in wetlands. In these cases, erosion controls will be used, grubbing will be kept to a minimum, and the disturbed areas will be restored to the original contour in order to maintain the original drainage and vegetation patterns.

5.2.11 Restoration and Grading

Once poles are installed, construction crews will grade any disturbed areas and apply temporary erosion control. Disturbed areas in uplands are typically seeded and/or mulched with hay or straw. Areas in wetlands are not seeded and are mulched with straw for permanent restoration. Temporary erosion control in wetlands may also be provided by applying straw over the exposed soil.

5.2.12 Establish Pull-pad Locations, Move Tensioning, Pull Equipment into Place

Pull-pads, often 175-foot by 100-foot, serve as level staging areas for installing pull ropes and conductor (see discussion below). The pull-pad sites vary in size and location but are always directly beneath the location of the conductor. Pulling angles, the length of the conductor on the reels, the type of equipment required, topography, and access restrictions determine the locations and sizes of the pull-pads. These sites must be level to support the weight of the equipment; as such, some grading may be needed, as described above. Where soils are saturated or soft, construction mats will be used for stability. Should

extreme conditions be encountered, on-site consultation will be performed with an environmental inspector and MDEP third-party inspector prior to locating any portion of a pulling or tension set-up in or near a protected natural resource.

The pullers and tensioners are typically mounted on large, flat bed-type tractor-trailer rigs, and can weigh in excess of 80,000 pounds. They frequently need to be anchored by a large bulldozer.

5.2.12.1 Installing Pull Ropes, Conductor and Tensioning

The conductor installation process involves three basic steps. A polypropylene line is first pulled through blocks on the insulators by using a helicopter or by workers on ATVs. A steel pulling wire connected to the polypropylene line is pulled from the conductor puller. The conductor puller then pulls the conductor through the blocks and the tension is set on the far end of the pull by equipment called a tensioner. Conductor pullers and tensioners require a large, level area for their setup as discussed above.

5.2.12.2 Clipping Conductor and Removing Blocks

Clipping the conductor involves removing the wire from the blocks and permanently clipping it in place at the bottoms of the insulators. There are three approaches applied: workers access each pole on foot and climb the poles to clip the wires; workers clip wires from bucket trucks; or workers access the poles from a helicopter. The bucket truck access requires that crane mats remain in place or are repositioned to support the equipment. There is a temporal lag between pole installation and clipping where mats may have been removed after installation and need to be reinstalled for clipping. Use of the bucket truck is the preferred method because it is generally more efficient for clipping than climbing the poles. Depending on the program schedule and access difficulties, workers can be flown in by helicopter, eliminating the need for access by bucket trucks.

5.2.12.3 Completing the Construction Inspection and Energizing the Line

After wire is pulled and clipped into place, a construction inspector checks the newly installed line for construction deficiencies. Any deficiencies that are found during the final construction inspection will be fixed by a construction “clean-up” crew. These crews typically require limited use of heavy equipment and reach program poles from the construction access road on foot. Impacts from these crews will be minimal to none. Once engineers have determined that the transmission line is in place and conductor is connected at each substation, the line is energized and brought into service.

5.2.12.4 Completing the Final Restoration and Walk-Through

The construction access travel paths and conductor-pulling setup locations within wetlands will be restored as closely as possible to pre-construction conditions. Contours and drainages will be restored. Disturbed wetland soils will be mulched with straw for final restoration in accordance with CMP's Environmental Guidelines. Upland areas will be seeded with a suitable annual seed mix and mulched with hay. Sometimes seeding will not be necessary as upland and wetland vegetation typically reestablishes quickly. Excess construction debris (litter, hardware, bracing) will be removed from the ROW and properly disposed of at a licensed recycling or solid waste disposal facility. No materials will be burned or buried on the ROW. Erosion and sedimentation controls will be installed as needed and maintained through the duration of the restoration efforts. These devices will be removed once the area has adequately revegetated; please see the Restoration Plan in CMP's Environmental Guidelines.

CMP personnel and/or qualified representative(s), including the environmental inspector, will walk through the completed project site and check for any potential erosion problems or areas that require further restoration work. Any identified problem areas will be permanently stabilized as soon as possible.

5.3 Substation Construction Sequence

Construction of the substation and equipment installation will generally consist of the steps listed below.

- Flagging of environmental resources and buffers;
- Installation of erosion and sedimentation controls;
- Construction of the stormwater management areas;
- Clearing and rough earthwork to prepare the construction area;
- Establishment of the construction pad to include the grounding mat, gravel, and crush stone base;
- Establishment of the new entrance road, if needed, and completion of final grading for the site footprint;
- Placement of concrete foundations;
- Construction of structures and electric equipment;
- Installation of the perimeter fence;
- Final electrical installation and testing;
- Connection of electrical lines to new equipment, and energizing of the new equipment (commissioning); and
- Completion of site stabilization and permanent restoration.

5.3.1 Flagging of Environmental Resources and Buffers

Prior to any tree clearing or construction work, environmentally sensitive resources and buffers will be flagged using a specified color of surveyor tape. “No-access” areas (such as certain stream buffers or archeological resources) will also be marked using appropriate color-coded tape and signage.

5.3.2 Installation of Erosion and Sedimentation Controls

Erosion control measures will be installed prior to the initiation of any construction or grading activities. Sediment barriers (i.e., erosion control mix, hay bales, and/or silt fences) will be installed between wetlands/waterbodies and all disturbed areas unless land contour conditions slope away from these resources. All erosion control measures will be routinely inspected and maintained throughout the duration of construction to verify that they are functioning properly. Any measures that appear to be failing will promptly be corrected and/or replaced.

5.3.3 Construct Stormwater Management Areas

Components of the stormwater management system will be graded and established as site grading is completed. Drainage will be maintained and culverts installed as needed.

5.3.4 Clearing and Earthwork

Clearing and earthwork at substations sites can begin after construction roads are established to the sites. New substations will require new access roads, and existing entrance roads will be used as appropriate at existing substation sites. Some entrance roads may not be suitable and either will need to be upgraded or will require the construction of new roads. New roads will be graded and filled, and drainage will be established, prior to being put into service.

Earthwork will be required to accommodate the proposed new substations construction. This will require the use of heavy equipment including excavators, bulldozers, and dump trucks to grub the proposed substation yards and place clean fill. The limits of the proposed work zone will be clearly staked before the commencement of earthwork activities. Although blasting is not anticipated, some controlled blasting may be required if bedrock is encountered. If blasting is required, proper safeguards will be employed to protect personnel and property in the vicinity of the blasting. Blasting mats will be used to prevent shot rock from scattering. Pre-blast surveys are typically performed to document the presence and condition of adjacent wells, personal property, and utilities in the vicinity. Blasting precautions and code compliance will be the contractual responsibility of the contractor.

Vegetated areas will be cleared and grubbed. Trees and shrubs will be disposed of or chipped on site, consistent with the Maine Slash Law[23]. The sites will be graded and filled as needed to build the sites up to the necessary elevations to establish drainage and a level building surface.

5.3.5 Concrete Foundation Placement

Concrete foundations (either precast or cast in place) will be installed to create pads for the new substations' equipment. These concrete pads will be constructed to engineering specifications and will not cause erosion or sedimentation.

5.3.6 Fence Installation

Following the completion of earthwork and placement of the concrete pads, a new chain-link fence will be installed around the perimeter of each new substation. This fence will be the standard fencing (eight feet tall with three strand barbed wire pitched at a 45-degree angle) installed at other CMP substations.

5.3.7 Electrical Equipment Installation and Energizing

The bulk of the electrical equipment including transformers, termination structures, switchgear, circuit switchers, regulators, reclosers, and the control building will be installed after the main footings and structures are in place. All this work will be completed within the substation footprint (fenced area).

5.3.8 Site Stabilization and Permanent Restoration

Disturbed soils within 100 feet of wetlands will be stabilized through mulching and establishing native vegetation in accordance with CMP's Environmental Guidelines.

Allowing native vegetation to regenerate naturally will be the preferred method for re-establishing permanent vegetation. CMP's Environmental Inspector will work with the third-party inspector (if required) to identify areas that may require seeding. Upland areas not adjacent to protected resources will be allowed to revegetate naturally. Areas of exposed soils in uplands will be mulched with hay and those in wetlands will be mulched with straw. Any construction debris (litter, hardware, and bracing) will be removed from the site and properly disposed of at a licensed disposal facility. No construction debris or any other materials will be burned or buried at the Project site. Erosion and sedimentation controls will be installed as needed and maintained through the duration of the restoration efforts. These devices will be removed once the area has adequately revegetated. Please see CMP's Environmental Guidelines for complete restoration details.

[23] 12 MRSA §M.R.S. §§ 9331 et seq.

CMP personnel and/or qualified representatives, including the environmental inspector, will walk-through the completed project site and check for any potential erosion problems or areas that require further restoration work. Any identified problem areas will be permanently stabilized as soon as possible.

5.4 HDD Construction Sequence

The following construction plan provides an overview of the process and techniques that will be implemented during the construction of the Upper Kennebec HDD project components. This plan is based on established HDD construction methods and is designed to minimize impacts to natural resources and expedite restoration after construction activities are completed.

Generally, the construction sequence for the HDD will be conducted in the following steps:

- Installation of erosion control devices;
- Initial clearing and grubbing;
- Access road improvements and construction;
- Temporary drilling site grading;
- HDD boring & conduit installation;
- Transition yard grading;
- Trench excavation and direct buried conduit installation;
- Termination station foundation, conduit, and ground grid installation;
- Termination station structure and equipment installation;
- Cable installation;
- Restoration and revegetation of temporary construction site areas;
- Removal of erosion control devices upon permanent stabilization.

It is estimated that construction of the HDD and termination stations will require approximately 6 months.

Tree clearing to accommodate the termination stations and temporary work areas will occur during transmission line clearing activities, as described in Section 5.2.5. Road improvements and extensions needed to gain access to the corridor will also occur during this time. Once clearing has been completed, access roads and temporary laydown areas established, erosion controls installed, and the temporary drill pads established, the construction process for the HDD boring and conduit installation will consist of four main steps: (1) pre-site planning; (2) boring a pilot hole; (3) expanding the pilot hole by reaming; and (4) pull-back of drill rig with simultaneous installation of casing (casing may or may not be required based on geotechnical study results). These four steps are discussed below.

5.4.1 Pre-Site Planning

The HDD process begins with conceptual engineering and a variety of data gathering activities including, but not limited to area topographic survey, wetland and protected natural resource surveys and mapping,

and geotechnical borings. Once the necessary data are accumulated, a conceptual bore hole alignment is defined. With the conceptual bore alignment defined, conceptual design is performed for the temporary construction areas and adjacent termination stations. Conceptual design of the construction areas and termination stations includes grading and drainage design, erosion and sedimentation control design, pre- and post-construction storm water management design, and site restoration design. The conceptual engineering phase will emphasize avoidance and minimizing impact to wetlands, vernal pools, forested communities, and sensitive wildlife areas. Conceptual engineering design will be performed in conjunction with the HDD contractor to ensure that the proposed bore alignment is achievable given geotechnical conditions as well as available equipment and expertise. The results of the pre-site planning phase will be used to determine the required size of drill rig, the number of drill head extensions, the conduit material, and the length and size of the conduit.

5.4.2 Drilling Pilot Hole

Upon completion of the pre-site planning phase HDD construction activities will begin with the drilling of the pilot hole. This is accomplished using a drill rig fitted with a steel drill pipe and cutting head. The drill rig will be set on a level working area behind a temporary fluid return pit and will be anchored. The drill rig will elevate itself to achieve the required entrance angle in accordance with the design bore alignment. As the drilling commences, a slurry composed of primarily water (95%) and a small amount of bentonite (approximately 5%), commonly called drilling mud, is pumped down the drill steel to the cutting head. Bentonite in the mud is a non-hazardous shrink-swell clay material which helps keep the borehole stable and helps lubricate the drilling operations. The pressurized mud drives the cutting head through a device called a “mud motor,” then it is expelled in front of the drill. By injecting the mud at the drill head, the drill cuttings are suspended within the mud and pushed back out of the bore hole to the fluid return pit adjacent to the HDD drill rig. Once the drill head has bored the full length of the drill steel segment into the earth, another segment of drill steel is added, and drilling commences; this process is repeated until the full length of the pilot hole is achieved.

Given the anticipated subgrade material at this site, it is expected that the bore process will advance between 150 feet and 200 feet per day. For the length of the proposed bore, the HDD operation will take approximately 6 months to complete the pilot hole and reaming operation. The duration of the operation could increase if very hard rock is encountered.

As described above, HDD requires the use of drilling mud and CMP has considered that during the HDD activity, there is a small possibility of drilling fluids reaching the ground surface by following vertical bedrock fractures. This is also known as an inadvertent release. CMP has developed a Requirements for

Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan for HDD Operations (Attachment L) that outlines the details of the HDD process, the monitoring and prevention procedures, and the measures that would be in place to respond to an inadvertent release of drilling fluids.

The Plan includes:

- Typical scenarios under which inadvertent release of drilling fluid could occur, and measures to prevent it;
- The required reporting process to Project personnel, CMP and state regulatory agencies;
- Procedural measures that would be taken to mitigate for a release;
- The type of drilling operation adjustments that could be made to minimize or prevent any additional releases; and
- Equipment or supplies available to contain an inadvertent release, and the disposal process for all collected directional drilling fluids.

5.4.3 Expanding the Pilot Hole

Once the drill head emerges at the far end of the planned bore (i.e., at the exit point), if necessary, the drill head will be removed, and a reamer head will be attached to the drill steel. The reamer head is a device that is a larger diameter than the drill head with similar cutting teeth. The reamer head is pulled back through the length of the bore hole to the original entry point. This operation incrementally increases the diameter of the bore. Depending on the final bore diameter, multiple push/pull passes may be taken with reamer heads of increasing diameter.

5.4.4 Installation of Conduit

Usually during the final reaming pass, when the bore hole is almost at its final diameter, a casing, duct, or sometimes the cable is pulled into the bore hole by attaching it to a swivel behind the reamer. In this way the final reaming pass also pulls the casing, conduit, or cable into the borehole. The need for casing is a function of the geological formation and construction schedule. If the hole is cased, it can be left open for some time, which will provide some level of flexibility in the construction schedule. Additionally, in the event that a cable fails, a cased hole will allow the old cable to be pulled out and a new cable to be installed. For this Project, the HDD bore hole will be cased to act as an electrical conduit for the HVDC transmission cables. Casings usually consist of thick-walled, high-density polyethylene, fusible PVC, or steel pipe. The selection of the casing material, and required strength of such material, is a function of the bore geometry, length, geology, and intended function. The final selection of the casing material is made

when the geotechnical borings have been analyzed and the final bore geometry designed. For this application, it is assumed a steel pipe or similar casing will be required.

With the drill rig completely extended to the end of the bore hole, sticking out of the earth at the receiving end, a pulling head is attached, as previously stated, sometimes directly behind the reaming head. The conduit is attached to a swivel at the pulling head, and the drilling rig retracts back through the boring hole pulling the conduit. An area approximately equal to the length of the bore path and approximately 50 feet wide will be required in-line with the bore entry hole. This area is required for the fabrication of the casing and equipment used to suspend it in a catenary as it is pulled into the HDD bore. The casing fabrication area will be within the current transmission ROW and no additional land will be impacted. In addition, since the casing will be under considerable strain during the pulling operation, it is necessary that a significant length of pipe be exposed above ground at each end of the completed bore when the pulling operation is complete. Once the stress is removed the casing will begin to relax and shrink back into the bore hole.

After the conduit is completely installed and allowed to relax, the transmission cables are pulled through using common cable pulling techniques. The conduit remains in place permanently to protect the transmission cables.

5.4.5 Trenching and Drilling Work Plan

The HDD drill rig will be set on a level graded working area. This temporary working area will be arranged in conjunction with the contractor to promote a safe and efficient workflow. The drill rig will be set behind an excavated pit that will collect and retain the drilling fluid (mud). The pit is estimated to be approximately 15 feet wide by 25 feet long and 5 feet deep. The drill fluid and cuttings will be collected in this pit and removed as necessary to keep drilling operations active. A system will be established to retain, process, and recirculate drilling fluids throughout HDD activities. Cuttings from the boring will be removed from the drilling fluid through gravity separation, cyclonic separation, or with a shaker table. The cuttings will be temporarily stored on site in a cutting pit, or a dumpster. The cuttings will be removed from the site and disposed of at an approved location. The receiving pit will be a similar but slightly smaller pit. Both pits must be installed before drilling operations begin.

In an effort to minimize the length of the HDD bore, buried conduit will be used to carry the transmission cables from the HDD bore to the termination structures in the termination station. Less than 400 feet of temporary, open trenching is anticipated between each termination station and the HDD points of entry. Trenching required to install conduit will be performed by a wheeled or tracked excavator to the greatest

extent possible. Typical trench dimensions will be 4 to 8 feet wide by 5 to 10 feet deep. If rock is encountered, it will be removed by the most suitable technique (e.g. hydraulic rock hammer or blasting) given the material characteristics of the rock. The preferred method for rock removal will by rock hammer. Trenches will be temporary and will be backfilled and revegetated after construction.

6.0 INVASIVE SPECIES CONTROL PLAN

Construction projects like the NECEC have the potential for the introduction and/or spread of invasive plant species. The objective of this Invasive Species Control Plan ("ISCP") is to avoid and minimize the potential introduction of invasive plant species as well as the spread of known populations of invasive plant species within project work areas. The following 83 plant species listed in Table 6-1 were advised by MNAP as Severely Invasive or Very Invasive, and all species will be monitored and addressed as part of the ISCP.

6.1 Invasive Plant Species to be Monitored

Table 6-1: Invasive Species Plant List

Species	Common Name	Form	Indicator
Acer ginnala	Amur maple*	Tree	NI
Acer platanoides	Norway maple*	Tree	NL (upland)
Actinidia arguta	Hardy kiwi	Vine	NI
Aegopodium podagraria	Goutweed*	Herbaceous	FAC
Ailanthus altissima	Tree of heaven*	Tree	NI
Akebia quinata	Chocolate vine; five leaf-	Vine	NI
Alliara petiolata	Garlic mustard*	Herbaceous	NL (upland)
Alnus glutinosa	European alder	Tree	NI
Amorpha fruticosa	False indigo*	Herbaceous	FACW
Ampelopsis glandulosa	Porcelainberry*	Herbaceous	NI
Berberis thunbergii	Japanese barberry*	Shrub	FACU
Berberis vulgaris	Common barberry*	Shrub	FACU
Butomus umbellatus	Flowering rush	Shrub	OBL
Cabomba caroliniana	Fanwort**	Herbaceous	NI
Callitriche stagnalis	Starwort	Herbaceous	NI
Cardamine impatiens	Narrowleaf bittercress	Herbaceous	NI
Celastrus orbiculatus	Oriental bittersweet*	Vine	FACU-
Cirsium arvense	Canada thistle	Herbaceous	FACU
Clematis terniflora	Yam-leaved virgin's bower	Vine	UPL
Cynanchum louiseae	Black swallowwort	Vine	NL (upland)
Cynanchum rossicum	Pale swallowwort	Vine	NI
Dioscorea polystachya	Chinese yam	Vine	NI
Egeria densa	Brazilian waterweed**	Herbaceous	OBL
Elaeagnus umbellata	Autumn olive*	Shrub	FACU
Epilobium hirsutum	Hairy willow-herb	Herbaceous	NI
Euonymus alatus	Winged euonymus*	Shrub	NI
Euonymus fortunei	Wintercreeper	Herbaceous	NI
Euphorbia esula	Leafy spurge	Herbaceous	NI
Fallopia japonica	Japanese knotweed*	Herbaceous	FACU

Species	Common Name	Form	Indicator
Fallopia sachalinensis	Giant knotweed	Herbaceous	NI
Fallopia x bohemica	Bohemian knotweed	Herbaceous	NI
Ficaria verna	Lesser celandine	Herbaceous	NI
Frangula alnus	Glossy buckthorn	Shrub	FAC
Glyceria maxima	English water grass	Herbaceous	NI
Heracleum mantegazzianum	Giant hogweed	Herbaceous	NI
Hesperis matronalis	Dame's rocket*	Herbaceous	FACU
Humulus japonicus	Japanese hops	Vine	FACU
Hydrilla verticillata	Hydrilla**	Herbaceous	NI
Hydrocharis morsus-ranae	European frog's bit**	Herbaceous	NI
Impatiens glandulifera	Ornamental jewelweed*	Herbaceous	FAC
Iris pseudacorus	Yellow iris*	Herbaceous	OBL
Lepidium latifolium	Tall pepperwort	Herbaceous	FACU
Ligustrum obtusifolium	Border privet	Shrub	NI
Ligustrum ovalifolium	California privet	Shrub	NI
Ligustrum vulgare	Privet*	Shrub	NI
Lonicera japonica	Japanese honeysuckle*	Shrub	NI
Lonicera maackii	Amur honeysuckle*	Shrub	NI
Lonicera morrowii	Morrow’s honeysuckle*	Shrub	FACU
Lonicera tatarica	Tartarian honeysuckle*	Shrub	FACU
Lonicera x bella	Bella honeysuckle*	Shrub	FACU
Lythrum salicaria	Purple loosestrife*	Herbaceous	OBL
Microstegium vimineum	Japanese stilt grass*	Herbaceous	NI
Myosotis scorpioides	Water forget-me-not	Herbaceous	OBL
Myriophyllum acquaticum	Parrot feather**	Herbaceous	OBL
Myriophyllum heterophyllum	Variable milfoil**	Herbaceous	OBL
Myriophyllum spicatum	Eurasian milfoil**	Herbaceous	OBL
Najas minor	Slender-leaved naiad**	Herbaceous	OBL
Nelumbo lutea	American water lotus	Herbaceous	OBL
Nitellopsis obtusa	Starry stonewort	Herbaceous	NI
Nymphoides peltata	Yellow floating heart**	Herbaceous	NI
Oplismenus hirtellus ssp.	Wavyleaf basketgrass	Herbaceous	NI
Persicaria pertoliata	Mile-a-minute vine*	Vine	NI
Phalaris arundinacea	Reed canary grass	Herbaceous	NI
Phellodendron amurense	Amur cork tree*	Tree	NI
Photinia villosa	Oriental photinia	Shrub	NI
Phragmites australis	Common reed	Herbaceous	FACW
Pistia stratiotes	Water lettuce	Herbaceous	OBL
Populus alba	White cottonwood*	Tree	NI
Potamogeton crispus	Curly pondweed**	Herbaceous	OBL
Pueraria lobata	Kudzu	Vine	NI
Pyrus calleryana	Callery ("Bradford") pear	Tree	NI
Ranunculus repens	Creeping buttercup	Herbaceous	FAC

Species	Common Name	Form	Indicator
Rhamnus cathartica	Common buckthorn	Shrub	UPL
Robinia pseudoacacia	Black locust*	Tree	FACU
Rosa multiflora	Multiflora rose*	Shrub	FACU
Rosa rugosa	Rugosa rose	Herbaceous	FACU
Rubus fruticosus	European blackberry	Herbaceous	NI
Rubus phoenicolasias	Wineberry	Herbaceous	NI
Stratiotes aloides	Water soldier	Herbaceous	NI
Thodotypos scandens	Black jetbead	Shrub	NI
Trapa natans	Water chestnut**	Herbaceous	NI
Utricularia inflata	Inflated bladderwort	Herbaceous	OBL

* Plant regulated by the Do Not Sell List, Horticulture Program, Maine Department of Agriculture, Conservation and Forestry
.
** Aquatic plant regulated by Maine DEP.

Prior to the start of construction of any area (e.g., substation) or any individual transmission line corridor segment of the Project, locations containing invasive plant species will be field identified by CMP. Field identification and characterization during the pre-construction survey will document, to the extent practicable, baseline conditions relating to the presence, distribution and abundance of the 83 invasive plant species. Survey results will be used to identify appropriate measures to be implemented to accomplish the objective of the ISCP: *prevent the introduction and spread of invasive species as a result of the construction of the NECEC project*. Post-construction monitoring will be conducted in areas disturbed by construction of the NECEC project. If any of the listed invasive species are introduced, spread, or increase in abundance due to the construction of the Project, appropriate treatment measures, including herbicide application, if allowed or otherwise approved by the MDEP (herbicides are currently prohibited in Segment 1), manual removal, mechanical removal, or biological treatment,) will be implemented in accordance with the VMPs.

6.2 Development of NECEC Invasive Species Vegetation Monitoring Plan

A variety of national, regional, and State resources have been reviewed, evaluated, and utilized to develop CMP's Invasive Species Vegetation Monitoring Plan for the NECEC project. In 2013 the USDA Forest Service produced a *National Strategic Framework for Invasive Species Management* (https://www.fs.fed.us/foresthealth/publications/Framework_for_Invasive_Species_FS-1017.pdf). The goal of this publication is to prioritize and guide "*the prevention, detection, and control of invasive insects, pathogens, plants, wildlife, and fish that threatens our Nation's terrestrial and aquatic ecosystems*", and is, therefore, similar to the objective of the ISCP for the NECEC project. The *National*

Framework is comprised of four elements: 1) Prevention; 2) Early Detection and Rapid Response; 3) Control and Management; and, where necessary, 4) Rehabilitation and Restoration.

To date, only limited comprehensive data have been collected for the Project. A review of data compiled by MNAP as shown on iMapInvasives Network[24] a GIS-based data management system used to assist citizen scientists and natural resource professionals, shows significant existing distribution of invasive plant species on Segments 3, 4, and 5 of the Project and much sparser distribution on Segments 1 and 2.

As noted on the MNAP web site, , the Maine Department of Agriculture, Conservation and Forestry ("DACF") adopted rules that went into effect on January 14, 2017 prohibiting the sale of 33 terrestrial plant species within the State of Maine (https://www.maine.gov/dacf/php/horticulture/invasiveplants.shtml). Additionally, MNAP and DACF have prepared Fact Sheets describing threats, habitat, and suggested control measures for specific invasive species including most of those listed in Table 6-1 above (https://www.maine.gov/dacf/mnap/features/invasive_plants/invsheets.htm).

Attributes of the invasive plant species described in MNAP's Fact Sheets have been considered in the development of measures to prevent the introduction and spread of invasive plant species by construction of the NECEC project. Life-form, fruit/seed characteristics, habitat, and dispersal mechanisms are relevant to the introduction and spread of invasive species. Several of the listed invasive plants are woody trees or shrubs with seeds/fruit/berries consumed by and commonly dispersed by wildlife and birds. Some of the invasive plants are vines that can climb outward from growth sites, while others – such as Oriental bittersweet – bear fruit that is also dispersed by birds and wildlife. The remaining species are herbaceous perennials with generally small seeds that disperse by wind or water or, in the case of *Phragmites* and Japanese knotweed, can also spread by roots and a network of rhizomes.

Assessment methods have been developed by the US Fish and Wildlife Service (USFWS) for the management of invasive plant species throughout its National Wildlife Refuge System (https://www.fws.gov/invasives/staffTrainingModule/assessing/inventory.html). Inventories or surveys linked to mapping and monitoring elements are used by the USFWS to select appropriate invasive plant management treatments. Monitoring procedures established for the New England region by the USFWS (https://www.fws.gov/invasives/staffTrainingModule/assessing/inventory.html) identify data to be collected in the field in terms of *abundance* (an estimate of number of plants) and *distribution* (extent over landscape) of specific invasive species with GPS (global positioning system) being used to

[24] Available at: https://www.imapinvasives.org/

document the location of occurrences. GIS (geographic information system) is then used to analyze this field data and select an appropriate invasive plant management action.

CMP's pre-construction and post-construction invasive species surveys will use a four-level characterization of abundance using canopy cover class ranges where "trace" (T) is considered to be <1%, low (L) is at 1–5%, moderate (M) is 5.1–25% and high (H) is 25.1–100%.

Monitoring procedures established for the New England region by the USFWS are based on data collected in a manner that is well suited to the objectives of the ISCP for the NECEC project. However, instead of characterizing abundance by an estimation of individual plant abundance (stem-count), the NECEC project will make use of the 4-level canopy cover classes presented above. Estimation of percent coverage is commonly used in wetland delineations for documenting vegetation abundance, and the 4-level classification is a practical and expedient means to characterize presence and abundance of the listed invasive plants. A fifth category of "not observed" has been added to document non-detection of any of the 83 listed invasive species.

6.3 NECEC Invasive Species Vegetation Monitoring, Control and Treatment

This Plan includes two monitoring stages: Pre-Construction and Post-Construction. Information collected during these respective stages will be utilized to implement measures to prevent the introduction and spread of invasive species as a result of the construction of the NECEC project. Additionally, a list of best management practices is provided to reduce the possibility of introduction, or the transport, of invasive species in the NECEC project area.

6.3.1 Pre-Construction Survey

Prior to the start of construction of any area or individual segment of the NECEC project, the area or segment will be inventoried and locations containing invasive plant species will be documented by use of an electronic data collection system integrated with a GPS unit. The Region 5 (New England) USFWS data form developed for national wildlife refuges was used as a guide to identify the types of data to be collected as it applies to the attributes unique to CMP's transmission line corridors and substation sites.

Survey segments of the NECEC project area, measuring 500-feet long - generally equivalent to the transmission line pole spans will be used as distinct survey segments. The abundance and, where concentrated and defined, the location of each of the 83 listed invasive species will be documented. Data will be collected in the Invasive Plant Species Survey electronic data collection system for each survey increment to develop the baseline pre- construction inventory. The pre-defined survey increments will be

established in GIS and placed on the GPS units used in the field. Information that will be collected within the footprint of work for each substation and transmission line survey segment includes:

- Invasive species
- Stage: B = berries/fruit, F = flower, L = leaves (non-fruiting/non-flowering), O = other.
- Abundance (within surveyed NECEC corridor segment or within substation work area):
  - NO = not observed
  - T = trace (<1%)
  - L = low (1.0 – 5.0 %)
  - M = moderate (5.1 – 25%)
  - H = high (> 25%).
- Distribution:
  - IO = infrequent occurrence – widely separated individuals >30 ft apart; no pattern to distribution.
  - ET = evenly throughout – individual plants occur at fairly regular intervals separated by 25 -150 ft; may be a pattern to the distribution.
  - LP = localized patches – isolated clump of a species, often at the initial site of introduction; may/may not be surrounded by another form of distribution, may be just one patch/several; typically, widely spaced (usually no closer than 300 ft) compared to frequent.
  - FS = frequent stands – similar to localized patch but occurring with more frequency and in larger numbers; typically, large clumps of plants close together (15-30ft apart) but not touching; many stands usually in view at once within segment.
  - DT = densely throughout – many plants growing singly or in clumps close together or touching, a monoculture, small gaps acceptable, large ones not, cannot walk through without touching plant(s) at all times.

Products of the baseline pre-construction survey will include a documentation of the presence, abundance, and distribution of the 83 listed invasive species along NECEC transmission line corridor segments and within substation work areas. This baseline data will be compared to Post-Construction survey results to determine if presence of invasive species pre-dated the NECEC or was caused or exacerbated by the construction of the NECEC project. The results of the pre-construction survey will be provided to the MDEP and USACE before the first growing season following construction, restoration, and stabilization of any area or any individual segment of the NECEC project.

6.3.2 Control Measure Implementation

In cases where distinct areas or populations of listed invasive species exceeding Low abundance (e.g. Moderate and High) are observed, colored flagging will be used to mark the field position prior to construction, and GPS will be used to record the population-center location of the invasive species

occurrence. Where possible, construction equipment will avoid ground disturbance in these areas. Dispersal of woody invasive plant species generally occurs by seed or fruit, so the opportunity for introduction or spread is generally low when seed or fruit would be generally absent during winter through early summer construction. Fruit or seeds from these woody species and Oriental bittersweet are also relatively conspicuous so that direct contact with these particular invasive species can either be avoided or, if this is not possible, readily addressed to control introduction or spread. Where practicable alternatives are available, construction access or movement throughout work areas will avoid passing through pre-existing stands or occurrences of invasive species during the growing season. Where this cannot practicably occur, before moving from a work area survey segment(s) determined to exceed a low abundance of invasive species, construction equipment including construction mats will be manually cleaned by scraping off excess mud, dirt, and vegetation that might contain invasive species seeds, fruit, or viable plant parts. Construction matting will be procured and utilized in accordance with requirements established by the Maine Forest Service and the US Department of Agriculture.

6.3.3 Construction Period Best Management Practices

A review of several state and federal agency invasive species guidance documents was conducted to compile a list of BMPs for constructing projects like NECEC. The agencies reviewed include: USDA, New Hampshire Department of Natural and Cultural Resources (“NHDCR”), USACE New England District, and New Hampshire Department of Transportation (“NHDOT”). Each agency has their own list of invasive species management practices for various construction activities in the fields of utility maintenance, forestry, or transportation. Below is a list of those BMPs most relevant to the construction of the NECEC project, which will be implemented before, during, and after construction. Additional BMPs may be added in certain field conditions, as requested by the project team, or as determined to be necessary by the various contractors working on the project.

1. Provide contractor training in the basic identification, control, and prevention of known invasive species in project work areas. (USDA)
2. Where and if possible, avoid or minimize contact with invasive species by avoiding known infestation locations. (USACE)
3. When practicable, schedule construction activities at times of the year when conditions are appropriate to minimize the risk of spreading known invasive species in work areas. (USACE)
4. Staging areas should be placed in locations where there are no known invasive species infestations. (NHDOT)
5. Minimize soil disturbance where possible and stabilize disturbed work areas by seeding and/or using mulch, hay, gravel, or other control measures to minimize the ability for invasive species to establish. (NHDOT)
6. Matting should be in good condition and free of any invasive plant parts before installation and

removal. (USACE)

7. In areas with known invasive species populations, all matting, equipment, tools, and other equipment leaving the site should be cleaned before removal. (USDA)
8. Daily inspection and cleaning of all tools, trucks, and personnel before leaving a site known to have invasive species populations. (USDA)
9. If the transport of soils or woody debris known to have invasive plant materials is required, cover materials before transport and abide by any state regulations for transport of invasive species. (NHDCR)
10. Regularly monitor active construction areas to assure all contractors, personnel, and inspectors are abiding by predetermined BMPs outlined within the project scope. (USDA)

6.3.4 Post-Construction Survey and Treatment

Post-construction treatment, including herbicide application where allowed,[25] to control capable species will commence the first year following completion of each transmission line segment/substation site. Thereafter, routine treatment for capable species control will take place during the first year of every 4-year vegetation maintenance cycle. Note that vegetation management practices and frequency will differ in areas of tapered vegetation.

In order to determine whether any of the 83 listed invasive species were introduced or spread as a result of NECEC project construction, a Post-Construction Survey will be conducted during June through September of the fourth year after stabilization of all areas where soil disturbance occurred (pole and structure sites, access and construction roads, material lay-down areas, substation sites, etc.). These specific locations will be monitored using the same survey method employed for the pre-construction survey. The data from the two survey periods will be compared to determine whether any of the 83 listed invasive plant species observed during the pre-construction survey were introduced or have increased in abundance within disturbed areas as a result of NECEC construction. This information will be evaluated so that locations requiring treatment may be addressed during the next cycle of vegetation management for capable species described above.

Treatment to eliminate or control the spread of invasive plant species will be implemented in those locations disturbed by construction of NECEC where *abundance* of an invasive plant(s) species has increased to a higher *abundance* level than that identified during the pre-construction survey of the larger survey segment or work area. CMP will identify and use those treatments known to be most effective for each invasive plant species. Treatment will be applied in accordance with standards specific to particular

[25] CMP has committed to not use herbicides in Segment 1.

protected natural resources and critical habitats. Objectives of this treatment are to prevent the introduction and spread of invasive species as a result of the construction of the NECEC project.

- At locations where an invasive species is found to be introduced into a survey segment, all detected stems located within the construction work area of that segment will be treated or otherwise removed.
- At locations where an increase of abundance in a survey segment (i.e., lower to a higher abundance level) of an invasive species triggers treatment, all detected stems located within the construction work area of that survey segment will be treated so that the abundance level will be no higher, and in some cases may be lower, than the pre-construction conditions for that species within the survey segment.

Typically, the effectiveness of treatment is readily recognized visually and will be evaluated prior to the end of the growing season at treatment locations. Areas will be treated again if the initial application did not effectively terminate the invasive plant species so that the abundance level is consistent with, or lower than, the pre-construction condition for that species within the survey segment. Thereafter, based on implementation of the treatment scenarios described above, any potential subsequent occurrence of invasive species in areas disturbed during Project construction would not be discernibly attributable to construction of the NECEC project. The results of post-construction monitoring and treatment for invasive species will be provided to the MDEP before the end of the growing season during which treatment occurs.

7.0 POTENTIAL IMPACTS, AVOIDANCE AND MITIGATION MEASURES

7.1 Avoidance and Mitigation Measures

CMP designed the Project to avoid or minimize adverse environmental effects to the extent practicable. The majority of the Project (73%) will be developed on lands already developed as CMP transmission corridors, and the remaining 27% will be developed in a region of the state where active timber harvesting occurs. CMP considers many factors in designing, constructing, and operating electric transmission line projects to avoid or minimize impacts on the environment. During the conceptual engineering design, structures are sited away from wetland resources and significant wildlife habitat to the extent practicable. Additionally, as discussed in Section 4.3, CMP minimizes the impacts of tree clearing by managing its corridors consistent with IVM techniques, adopted by federal agencies as the best practices standard within utility ROWs. IVM promotes the development of early successional growth and resists the growth of vegetation into taller strata (trees) through the application of environmentally friendly manual, mechanical, and chemical treatments on a four-year maintenance cycle. IVM is recognized as a practice that reduces impacts on land, water, habitat and wildlife while meeting the goals of providing reliable and safe electrical service. The majority of the Project ROW will be managed in an early successional growth pattern with a few exceptions where taller vegetation will be allowed to persist to address rare, threatened or endangered species, habitat fragmentation, and visual impact concerns. To further minimize impacts, CMP has committed to not using herbicides in any location along the 53.5 miles of new corridor (Segment 1).

During the construction, operation, and maintenance of the Project, CMP will implement measures to minimize adverse effects to the extent practicable and will otherwise mitigate for such effects (See BMPs in Attachment E). The impact minimization measures proposed for this Project are based on CMP's extensive historical and recent experience in the construction, operation, and maintenance of the existing transmission lines along the Project ROWs, on the results of the field investigations and agency consultations conducted for the Project, and on recent, directly relevant expertise in siting and constructing facilities, most notably the very successful MPRP.

However, despite these extensive impact avoidance and minimization efforts, the development of the NECEC will result in unavoidable short- and long-term effects on certain environmental resources. As described in Section 9.0, these unavoidable impacts will be offset by compensatory mitigation.

The following sections describe CMP's avoidance and minimization impacts to:

- Topography and Geology

- Soils
- Wetlands and Watercourses
- Floodplains
- Groundwater Resources
- Protected Species
- Cultural Resources
- Land Use
- Air Quality
- Noise

7.2 Topography and Geology

The construction and operation of the NECEC will have negligible effects on topography and geology. These effects will be concentrated in the vicinity of work sites along the ROWs and new substation sites.

The transmission line and substation components will be sited and designed to best conform to existing topographic features. In locations where grading and filling will be required for construction of the transmission line, such as at certain structure sites where work pads must be established, or along access roads that must be improved or developed to safely support construction equipment, these areas will be restored to pre-existing contours and revegetated once construction is complete and final restoration has been established. Grading will not be required in areas where the terrain along the ROWs is relatively level, where no access road improvements or new access roads are needed, or where the conductors are installed within the underlying terrain.

Blasting may be required in order to install transmission line support structures, and/or for substation construction. For transmission line construction, blasting activity will be limited to the small volume of material needed to be removed to fit and plumb pole structures. Blasting that may be required for construction of substations will be achieved through blast detonation in delayed series that will result in no greater impact or vibration than those charges required for setting transmission line structures. CMP submitted a Blasting Plan with its Applications submitted in September 2017[26] that describes the proposed pre-blast procedure, the monitoring of surrounding properties and infrastructure, and all proposed safety measures, including those pertaining to transportation and use. No adverse effects on either sensitive natural resources or adjacent property owners are anticipated from blasting activity due to the small charges required.

[26] Site Law Application, Section 20.0, submitted to USACE on 9/29/2017.

The NECEC transmission line or substation development will not alter the existing watersheds, and any grading or other construction activity will not permanently modify natural contours or drainage ways in such a way that natural drainage patterns will be changed.

7.3 Soils

CMP analyzed soils within the Project's transmission line corridor and related substation facilities locations, provided descriptions of all soils identified along the NECEC corridor, provided Floodplain and Soils Series Maps depicting soils located along each Project Segment, and completed Class B high intensity soil surveys and Geotechnical Reports (Attachment G) for the Merrill Road Converter Station, Fickett Road Substation, Moxie Gore and West Forks termination stations. Soil surveys for the existing substation facilities (Coopers Mills, Crowley's, Larrabee Road, Maine Yankee, Surowiec, and Raven Farm) were not completed because all upgrades will be located within the existing fence lines or within areas where soils have previously been characterized. The soil surveys and geotechnical reports provide a detailed analysis of major limitations presented by the soil conditions at the substation sites and present potential design accommodations to address those limitations. In the locations where soils have limitations, proper engineering techniques will be implemented to overcome the limitations of the soils. This may include the removal of native soils and the importation of adequate soils.

CMP also developed a standard manual, the Environmental Guidelines (Attachment E), which it uses as a routine part of all transmission and substation projects, and which contains effective and proven erosion and sedimentation control requirements, standards, and methods that will be used to protect soil and water resources during construction of the various NECEC Project components. The manual is modeled after and is consistent with the DEP Maine Erosion and Sediment Control Best Management Practices (BMPs) dated March 2014, DEP's Erosion and Sediment Control Law (38 M.R.S. § 420-C), DEP's Chapter 500 (38 M.R.S. § 420-D), and Maine Forest Service (MFS) Slash Law (12 M.R.S. § 9333), and contains specific BMPs appropriate for electric transmission line and substation construction. Pursuant to the manual, CMP will minimize the extent and duration of soil disturbance, protect exposed soil by diverting runoff to stabilized areas or vegetated filter strips, install temporary and permanent erosion control measures, and implement an effective inspection and maintenance program. Specific erosion and sedimentation controls for each substation development site are provided on the grading plans included in the Stormwater Management Reports, Attachment M.

CMP recognizes, through its experience on the MPRP and other projects, the importance of communicating to its contractors that erosion controls often must be augmented with additional lines of sedimentation control (e.g., erosion control mulch backed by silt fence) to prevent turbid discharges from

impacting protected natural resource areas. CMP will incorporate a program of identifying areas of environmental risk based on topography, soils, and other unusual construction conditions. Environmental inspectors will meet with contractor personnel and third-party inspectors to discuss these areas and to form a consensus on the appropriate erosion and sedimentation control approach. Additionally, areas identified as having a higher risk will be tracked by the environmental inspection team and will be subject to a higher frequency of inspection[27].

CMP has evaluated Segment 1 of the Project, using a GIS analysis of both soil types (soils classified as highly erodible or potentially highly erodible) and percent slope (>22%). Areas with higher erosion risk have been determined (see Table 7-1) and will be tracked closely during construction. However, site specific conditions may merit the addition of distinct locations to this list. All areas will be evaluated during preconstruction walkovers with the construction contractors and the MDEP third party inspectors. Any additional high-risk areas identified by CMP environmental compliance inspectors, MDEP third party inspectors, and/or construction management or contractor personnel, during the walkovers or during construction, will be added to the high-risk tracking table. Contractors will be required to have a dedicated erosion and sedimentation control crew in Segment 1 of the Project. CMP will inspect higher risk areas with greater frequency and will implement robust and effective environmental controls in these areas including the use of multiple structural erosion and sedimentation control devices in combination with water bars, diversions, and sediment traps, as needed, as shown in Figure 7-1. The extent and duration of exposed soils within high-risk areas will be limited to the maximum extent practicable.

[27] Site Law, Section 14.0, Updated and submitted with the MDEP Stormwater Review Memo on 1/28/2019.

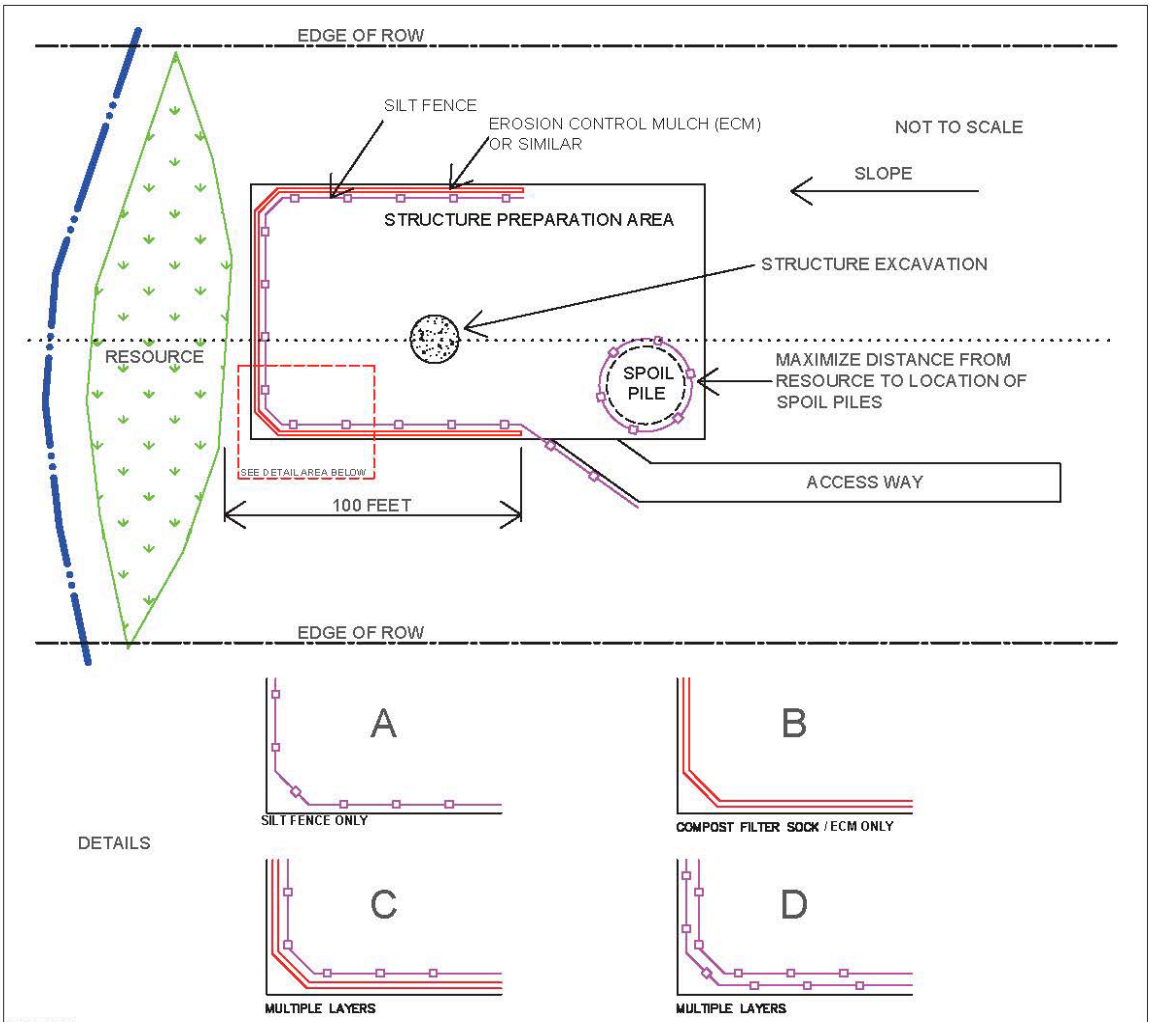
Table 7-1- Areas on Segment 1 with Higher Erosion Risk

Structure Number	
From	**To**
3006-11	3006-12
3006-17	3006-19
3006-21	3006-27
3006-28	3006-30
3006-40	3006-43
3006-47	3006-48
3006-50	3006-51
3006-53	3006-60
3006-65	3006-70
3006-74	3006-75
3006-77	3006-79
3006-80	3006-84
3006-87	3006-93
3006-96	3006-97
3006-104	3006-119
3006-130	3006-134
3006-144	3006-148
3006-154	3006-155
3006-167	3006-169
3006-175	3006-176
3006-177	3006-197
3006-199	3006-217
3006-218	3006-229
3006-230	3006-234
3006-235	3006-239
3006-240	3006-258
3006-263	3006-264
3006-266	3006-267
3006-271	3006-287

Each week, erosion and sedimentation control ("ESC") inspection and maintenance logs to be maintained by the ESC crew shall be reviewed by the third-party inspectors who shall report their findings to the MDEP per Chapter 500 Appendix B(1)(c).

Prior to the construction, CMP shall provide a construction plan including the construction timetable, access roads to be used in the construction, contractor, ESC crew, environmental inspector and third-party inspector information for the MDEP's review and approval. Long stretches of high-risk areas (e.g. 11.4-mile section between structures 3006-199 & 3006-258) may require multiple inspectors. CMP shall also provide a plan showing the Project's progress (disturbed, stabilized areas) to the MDEP monthly during the construction.

Figure 7-1: Erosion and Sedimentation Control for Structure Installation in High Risk Areas



NOTES:

1. SPOIL GENERATED AND USED ON THE SAME DAY MAY BE TEMPORARILY STOCKPILED NEAR THE EXCAVATION UNDER DRY WEATHER CONDITIONS ONLY.
2. WHERE PRACTICABLE, INACTIVE SPOIL PILES WITH HIGH SILT OR CLAY CONTENT WILL BE LOCATED A MINIMUM OF 150 FEET FROM RESOURCES.
3. INSTALL SILT FENCE OR EROSION CONTROL MULCH IN THE SINGLE LAYER CONFIGURATION (DETAILS A AND B) AROUND ALL HIGH SILT AND CLAY CONTENT SPOIL PILES LOCATED GREATER THAN 150 FEET FROM RESOURCES.
4. INSTALL EROSION AND SEDIMENTATION CONTROLS PER THE MULTIPLE LAYER CONFIGURATIONS (DETAILS C AND D) IN ALL AREAS, INCLUDING TEMPORARY STOCKPILES, THAT ARE WITHIN 100 FEET OF RESOURCES WHERE THE SOIL HAS HIGH SILT OR CLAY CONTENT.
5. INACTIVE SPOIL PILES WILL BE MULCHED AT A RATE OF 3.5 TONS PER ACRE.

NEW ENGLAND CLEAN ENERGY CONNECT

CENTRAL MAINE POWER COMPANY

Figure 7-1

EROSION AND SEDIMENTATION CONTROL FOR STRUCTURE INSTALLATION IN HIGH RISK AREAS

7.4 Wetlands and Watercourses

7.4.1 Wetlands

CMP first sought to avoid and then minimize impacts to wetlands wherever practicable through a thorough alternatives analysis (see Section 8.0) and thoughtful engineering design. Transmission line structure locations are sited in uplands to the extent possible in a manner that the transmission line spans the majority of wetland and other protected natural resource areas. In addition, temporary access roads have been designed to cross wetlands at their narrowest points, wherever possible[28]. As a result, most potential effects to wetlands associated with the development of the Project will be temporary, with the exception of unavoidable structure placement within wetlands, tree removal, and permanent fill associated with substation, converter station, and termination station development and permanent access. Where impacts cannot be avoided, a number of measures will be employed prior to and during construction to minimize impacts. These include measures such as: flagging and/or signage to identify sensitive resource areas and signal to construction workers that special restrictions and/or requirements apply in these areas, installation of erosion and sedimentation controls, the use of equipment mats, and prioritizing clearing during frozen conditions where practicable. Areas of temporary impact will be restored and revegetated as per the restoration measures described in CMP's Environmental Guidelines.

Necessary clearing of the transmission line corridor will be limited to the removal of mature trees and capable species (i.e., trees capable of attaining heights that would cause safety/reliability problems due to their proximity to the conductors), as necessary, to allow placement of pole structures and to ensure adequate clearance between any vegetation and the conductors. The removal of capable species in forested wetlands will result in a long-term conversion of wetland habitat type from forested to scrub-shrub and/or emergent. The removal of understory vegetation and ground cover will be required only as needed to install a structure, to create access to or within the corridor, and for puller/tensioner sites. Restoration activities following construction will restore site contours to pre-construction conditions and ensure that areas disturbed during construction will be revegetated as discussed in CMP's Environmental Guidelines.

Temporary, permanent, and secondary effects to wetlands are discussed in detail in Section 9.0. In addition, the Wetland Functions and Values Assessment ("FVA") provided as part of CMP's MDEP NRPA application submitted in 2017 has been updated and is included as Attachment I. The FVA

[28] Temporary access routes have been designed with consideration given to various siting constraints and safety. For example, access roads were sited to avoid crossing mid-span below existing transmission lines and to avoid guy wires within existing transmission line ROWs.

evaluates all wetland areas under state or federal jurisdictional that may be impacted by the NECEC and demonstrates that wetland and surface water alterations or impacts that will result from construction and maintenance of the proposed NECEC facilities will not cause significant degradation of existing wetlands functions and values.

7.4.2 Watercourses

With the exception of a Culvert Replacement Plan proposed to enhance fisheries habitat, discussed further in Section 9.0, direct impacts to waterbodies through the installation of access roads, transmission line structures, and substation development will be avoided. Potential indirect impacts include sedimentation and turbidity, introduction of pollutants, and locally increased stream insolation (exposure to sunlight) associated with the construction of utility corridors (Peterson 1993). As discussed below, these indirect impacts will be minimal and will not cause significant degradation of the aquatic environment.

Potential sedimentation associated with soil disturbance from equipment use and vehicle access can result in temporary short-term impacts to fishery resources. Sedimentation can result in reduced light penetration, smothering of aquatic feeding and spawning areas, and impairment of aquatic respiration. Sedimentation can also impact the quality of coldwater fish habitat in waterbodies by increasing the level of substrate embeddedness[29] , reducing habitat complexity, and altering stream channels. To avoid these problems, CMP will implement its Environmental Guidelines during construction to minimize the potential for sedimentation and to protect fishery resources. CMP's Environmental Guidelines include detailed erosion and sedimentation control measures, resource identification procedures, access road and equipment travel impact minimization measures, and restoration and stabilization measures that will minimize the potential for impacts to waterbody resources.

Increased sun exposure on smaller waterbodies due to transmission line tree clearing can result in a negative impact due to an increase in water temperature, which can pose problems for coldwater fisheries. Tree clearing has been minimized by utilizing existing transmission line corridors, where practicable, and on specific segments additional clearing will be required to increase the portion of the cleared transmission line corridor to the width necessary to construct and safely operate the facilities. The waterbody crossing table located in Attachment B identifies the amount of additional clearing width required within each respective corridor, if applicable. Peterson (1993) has reported that the removal of tree canopy (on new transmission line corridors) increases stream insolation during the short term, but within two years the areas are bordered by dense shrubs and emergent vegetation and water temperatures are not significantly higher than upstream forested reaches.

[29] Substrate embeddedness is defined as the extent to which larger particles are buried by finder sediments (MacDonald et al. 1991)

To minimize any potential for negative impacts to stream habitat and fisheries from vegetative clearing, CMP proposes to allow vegetation to remain in place to the extent practicable and install appropriate sedimentation controls (See BMPs in Attachment E). Furthermore, all waterbody crossings will be spanned by the NECEC transmission line, and no work will take place within stream channels. No new poles will be installed within 25 feet of these waterbodies, and only minimal tree removal is proposed in these stream buffer areas. All capable species will be removed from the stream buffer during initial clearing for construction. Vegetation maintenance, conducted on a 4-year cycle, in the stream buffer areas will consist of cutting back to ground level, all woody vegetation over 10 feet in height, whether capable or non-capable within that portion of the 25-foot stream buffer within the wire zone (i.e., that area within 15 feet, horizontally, of any conductor). Only capable species will be removed outside of the wire zone during vegetation maintenance activities. Otherwise, stream side vegetation will not be disturbed during construction or during future maintenance activities and the buffer will continue to function in a similar manner as before construction. Future maintenance activities in these areas will consist of hand removal of those capable species that are likely to encroach on the conductor safety zone within the next 4 years. Herbicides will not be used within the stream buffers, within 25 feet of standing water or along any portion of Segment 1. Stream buffers are described in more detail in the NECEC VCP and VMP (Attachment E).

Construction of the Project will require temporary equipment access across certain waterbodies to reach structure installation locations. CMP has designed access routes to minimize the number of crossings that will be required and has avoided crossings of larger waterbodies where possible. Where practicable, access road approaches and temporary equipment spans have been designed to cross waterbodies in a perpendicular fashion to limit the disturbance of vegetation and soils immediately adjacent to waterbodies. CMP will also utilize existing access roads where feasible to minimize disturbance.

CMP has included detailed measures to minimize potential sedimentation and turbidity associated with equipment crossings within its Environmental Guidelines and as depicted in Figure 7-2. Bridges (also known as equipment spans) are the preferred method for temporary access across waterbodies. The use of bridges avoids or minimizes potential disturbance to the waterway bed and banks. Most bridges can be quickly removed and reused without significantly affecting the stream or its banks and without interfering with fish migration. All equipment bridges will be routinely cleaned of accumulated sediment deposited by construction traffic; removed sediment will be placed in an upland area and stabilized to prevent its introduction into a waterbody.

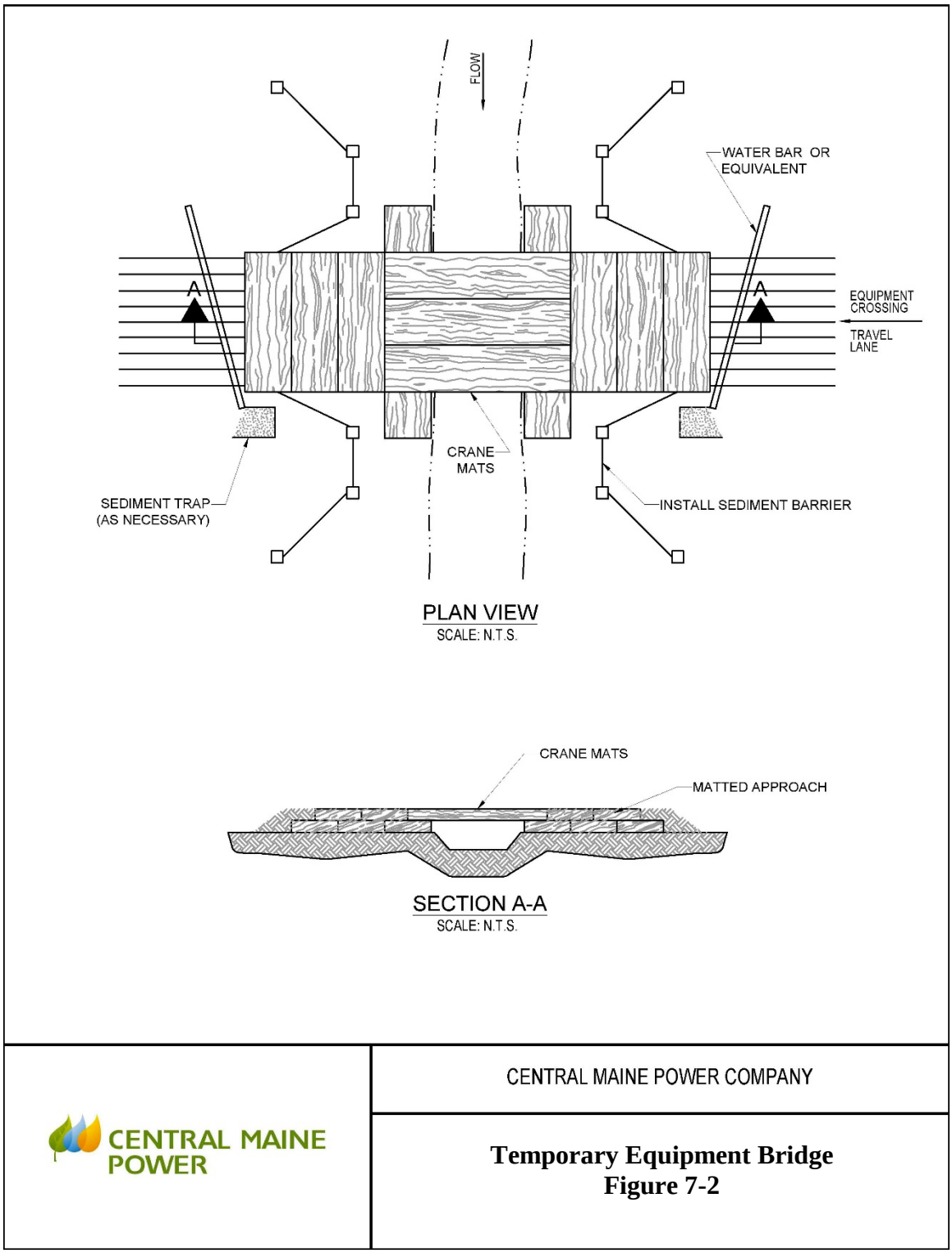
Another potential negative impact to waterbodies is inadvertent spills from construction equipment. The multiple methods, plans, and procedures to prevent surface water degradation during construction, operation, and

maintenance of the proposed NECEC transmission lines are incorporated into CMP's Environmental Control Requirements (Attachment E) and in the Requirements for Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan for the HDD process (Attachment L).

These procedures establish a set of minimum requirements for spill prevention and response. The procedures incorporated into the plan have proven successful for preventing spills and for addressing spills if they occur. CMP's environmental inspectors will ensure that all personnel working on the site follow these procedures. These measures will ensure that potential impacts to fishery resources are minimized.

In summary, the implementation of BMPs, including erosion and sedimentation control measures, vegetative buffer strips, careful placement and maintenance of stream crossings, and spill prevention and control measures will ensure that waterbodies and associated fisheries will not be adversely affected by the construction and maintenance of the Project.

Figure 7-2: Temporary Equipment Bridge



7.4.3 Vernal Pools

As discussed in Section 4.4.3, vernal pools were split into two categories: SVP's, regulated by both the MDEP and the USACE, and USACE-only jurisdictional vernal pools. The access to and placement of structures has been designed to avoid and minimize impacts to vernal pools to the maximum extent practicable. There will be no structures installed within SVP depressions and only three of 700 USACE-only jurisdictional pool depressions will be directly impacted. In instances where an SVP's critical terrestrial habitat (area within 250 feet of the vernal pool depression) spans the entire width of the corridor; impacts associated with equipment access will be minimized by utilizing timber mats to reduce disturbance. Please see Attachment B for a summary of impacts to SVPs (Exhibit B-3) and USACE-only jurisdictional vernal pools (Exhibit B-4).

Some vernal pools will be spanned by electric conductors and there is the potential for limited indirect impacts through conversion of minor amounts of adjacent forested uplands and wetlands. The potential for these indirect impacts is minimal since the transmission line corridor will be maintained in a well vegetated state, and only a small proportion of the forested area around any of these pools will be removed for the proposed transmission line corridor. Temporary impacts to adjacent wetlands can occur from equipment travel along the transmission line corridor. These impacts will be minimized by working during frozen conditions or by employing other techniques to minimize impacts. Disturbed areas within the 250-foot critical terrestrial habitat of significant vernal pools will be stabilized and restored as soon as practicable.

As described below, CMP's construction, maintenance, and operations practices in transmission line corridors are consistent with significant vernal pool habitat management guidelines and goals in NRPA Chapter 335 and Calhoun and Klemens (2002):

1. No disturbance within the vernal pool depression without prior approval from MDEP and MDIFW. CMP expends a great amount of land acquisition, design, engineering, and construction effort to ensure that vernal pool depressions are not disturbed during construction and maintenance activities. These efforts include (1) environmental oversight during the Project design phase to ensure that pole structures are not placed in vernal pools; (2) implementing and maintaining erosion and sedimentation controls that help prevent siltation of pools; (3) marking vernal pool depressions with flagging tape prior to construction; and (4) performing environmental inspections during construction to ensure that pools are not traversed by vehicles and construction equipment.
2. Maintain a minimum of 75 percent of the critical terrestrial habitat as unfragmented forest with at least a partly-closed canopy of overstory trees to provide shade, deep litter, and woody debris. Although

transmission line corridors cannot be maintained as forest for reliability and safety reasons, they are maintained as early-successional habitat composed of shrubs and herbaceous plants. This habitat type provides moderate shading, significant litter accumulation (carbon input) from leaf drop and the die-back of herbaceous vegetation, and woody debris. The NECEC has been sited within existing transmission corridors to the greatest extent practicable (73% of the Project is located within existing corridors) to minimize the extent of forest clearing.

3. Maintain or restore forest corridors connecting wetlands and significant vernal pools. Within transmission line corridors, amphibian travel corridors composed of shrubs and thick growth of herbaceous vegetation are often present. Also, based on a Position Paper on the Presence of Significant Vernal Pools in or Adjacent to Transmission Line Corridors in Maine (Section 9.0, Exhibits 1-7 and 1-8) prepared for CMP by TRC Engineers, LLC in 2009 (TRC 2009), it is expected that transmission line corridors and their early-successional habitat are permeable to amphibian migration.
4. Minimize forest floor disturbance. With the exception of pole structure locations, transmission line corridors are not grubbed; rather, trees are cut at ground level and root systems are left in the ground. In addition, mitigation techniques including winter construction and the use of equipment mats are utilized during construction to minimize ground disturbance such as rutting. By virtue of transmission line corridor construction and maintenance practices, ground disturbance is minimized to only that necessary for safe construction.
5. Maintain native understory vegetation and downed woody debris. Transmission line corridors are constructed and maintained to encourage the growth of understory vegetation including shrubs and herbaceous plants. Also, downed woody debris from shrubs occurs naturally, and removed capable tree specimens, left in place to decompose, is very common in transmission line corridors.

CMP will also utilize measures to prevent erosion and sedimentation within all wetland areas on or adjacent to the proposed transmission line corridor, as described in 7.3. CMP will implement its Environmental Guidelines (Attachment E) during the construction of the NECEC to minimize the potential for sedimentation and to protect vernal pool resources. CMP's Environmental Guidelines include detailed erosion and sedimentation control measures, resource identification procedures, access road and equipment travel impact minimization measures, and restoration and stabilization measures that will reduce potential impacts to vernal pools in the Project area. Finally, CMP has developed a detailed Compensation Plan (see Section 9.0) through consultation with state and federal resource and regulatory agencies to address impacts to both significant vernal pools and vernal pools that are USACE-only jurisdictional. The avoidance and minimization measures and compensation for unavoidable impacts proposed by CMP will result in no significant degradation of the aquatic environment associated with vernal pools.

7.5 Floodplains

Throughout the NECEC Project there are a total of 24 new transmission line structures that will be installed in a 100-year flood zone; the number of structures per transmission line component is listed in Table 7-2 below. Because of the limited additional impervious surface associated with each transmission line structure, construction and maintenance of the proposed transmission lines will not cause or increase flooding or cause an unreasonable flood hazard to any neighboring structures. Furthermore, the Project will not negatively affect runoff infiltration relationships. Flood zone determinations were derived from FEMA Flood Insurance Rate Map ("FIRM") data, however it should be noted that portions of the Project are located in unmapped areas. Flood zone maps that intersect the transmission line corridor are provided in Attachment A. Table 7-2 provides the map series identification within Attachment A for those structures within a FEMA 100-year flood zone.

Table 7-2: NECEC Transmission Line Structures within mapped FEMA 100-Year Flood Zone

Component	Number of Structures within 100-year Floodplain
Segment 1[a]	0
Segment 2	0
Segment 3	3
Segment 4	16
Segment 5	5

Surowiec Substation and the proposed Fickett Road Substation are partially located within FEMA-designated 100-year flood zones. The Coopers Mills Substation, Larrabee Road Substation, Maine Yankee Substation, the proposed Merrill Road Converter Station and West Forks and Moxie Gore Termination Stations are not located within a FEMA-designated 100-year flood zone. The Merrill Road Converter Station and the Fickett Road Substation will be designed and constructed at a final elevation such that their equipment will not be inundated during a 100-year flood event.

7.6 Groundwater Resources

Construction and maintenance of the NECEC Project transmission lines or the new substation facilities will not require use of groundwater, therefore there will be no impact to groundwater quantity. Potential sources of groundwater quality degradation differ during the construction, maintenance, and operation phases of transmission line and substation facilities, as discussed below. Measures that will be employed to minimize these potential threats are detailed in Section 7.6.2.

7.6.1 Potential Impacts

7.6.1.1 Construction

During the construction phase, potential sources of groundwater contamination will be limited to fuel and hydraulic and lubrication oils used in the operation and maintenance of vehicles and construction equipment. Spill reporting and cleanup procedures will be in place to promptly address any spills. To further minimize the potential for adverse water quality impacts from spills, no fuel storage, refueling, vehicle parking or vehicle maintenance will be performed within 100 feet of protected wetlands or other waterbodies, unless no practicable alternative exists and only if secondary containment with 110% capacity is provided for any fuel storage containers and tanks. The above activities will also not occur within 200 feet of a private water supply or within 400 feet of a public water supply.

7.6.1.2 Maintenance and Operation

Potential sources of groundwater contamination will include fuel and hydraulic and lubrication oils used in the operation and maintenance of vehicles, as well as the application of herbicides to control vegetation (with the exception of Segment 1, where no herbicides will be applied). NECEC electrical transmission line corridor maintenance practices will encourage the growth of herbaceous and scrub-shrub vegetation that will not present safety or electrical reliability problems. Trees within the corridor that have the potential to grow up into the conductor safety zone ("capable species") must be removed for safety and reliability reasons. CMP will use a selective herbicide program to treat areas once every four years to maintain an early successional (i.e. scrub-shrub and herbaceous) stage of vegetation. All herbicide usage will be in compliance with all label requirements and standards established by the Maine Board of Pesticides Control ("MBPC"). Herbicides will be selectively applied to capable species, using low-pressure (hand-pressurized) backpack applicators, to prevent growth of individual capable specimens and to prevent regrowth of cut capable specimens. Individual capable specimens will be treated with herbicides, and no broadcast application will be done. CMP will not use herbicides within 25 feet of any waterbody or standing water. In addition, CMP will not use herbicides within 100 feet of a known well or spring or within 200 feet of any known public water supply. Furthermore, CMP will not store, mix, or load any herbicide within 100 feet of any surface water, unless performed on a public road. Only trained applicators working under the supervision of MBPC-licensed supervisors will apply herbicides. Herbicides will be applied only during periods when potential for rain wash off is minimal, and only when wind speeds do not exceed 15 miles per hour, in order to minimize off-target drift.

The selective use of herbicides on the NECEC Project's transmission line corridors, following the requirements described above and as defined in CMP's Post-Construction Vegetation Management Plan (VMP) provided in Attachment E, will not pose a threat to groundwater quality.

Substations and transmission line facilities constructed and/or modified as part of the NECEC Project will include equipment that contains fuels and lubricants, as well as oil-filled electrical components. As with existing CMP substations, SPCC Plans will be prepared to address potential leaks for each of these substations in accordance with the requirements of 40 C.F.R. Part 112. As well, NECEC substations (new and modified) will be constructed with engineered perimeter and/or subsurface oil containment in order to minimize the potential for oil releases to reach navigable waters.

7.6.2 Prevention and Protection

The multiple methods, plans, and procedures to prevent groundwater degradation during construction, operation, and maintenance of the NECEC Project are incorporated in CMP's Environmental Control Requirements (Exhibit E). These procedures establish a set of minimum requirements for spill prevention and response. The procedures incorporated into the plan have proven effective for preventing spills and for addressing spills if they occur. CMP's environmental inspectors will ensure that all personnel working on NECEC construction sites follow these procedures. Additionally, CMP will prepare an inventory of water wells and septic systems that require abandonment on properties acquired during the NECEC Project and will implement the procedures discussed in Section 7.6.2.1.

7.6.2.1 Spill Management and Prevention

CMP employees and contractors follow the procedures outlined in the Spill Management and Prevention section of CMP's Environmental Procedures Manual for response to any spills of oil, gasoline, hydraulic oil, or other similar substances. These procedures are similar to those outlined in CMP's Environmental Control Requirements for contractors, and cover reporting, immediate response, cleanup, and documentation. Employees operating construction vehicles will be trained to promptly contain, report, and clean up any spill in accordance with standard procedures. As a standard CMP operating procedure, all substation vehicles carry an oil spill kit that contains materials for conducting initial containment and clean-up of spills. In the event of a spill of oil or hazardous material, on-site personnel will immediately implement standard spill reporting, containment and clean-up procedures.

SPCC plans will be prepared or amended for each new or expanded substation in accordance with the requirements of 40 C.F.R. Part 112 once equipment has been selected for the station and its oil quantity known. The substations are designed to contain any spill within the fence line of the station, and a goal of

each SPCC plan will be to clean up spills before oil can migrate from the station or into the surface water or groundwater. This application does not include copies of the SPCC plans; however CMP expects the MDEP to make preparation and submission of the SPCC plans, prior to federally regulated quantities arriving on site, a condition of approval.

Spills that are properly cleaned-up will not pose a risk to groundwater quality. Based on normal operations and the typical timeliness and thoroughness of routine spill clean-ups, there is no need for ongoing groundwater monitoring during construction of the NECEC Project.

7.6.2.2 Water Well and Septic system Abandonment

If it becomes necessary to raze any structures to facilitate the construction of NECEC, CMP will document the presence or absence of water wells and septic systems and follow proper abandonment procedures.

Water well abandonment procedures

All water wells on properties with structures designated for demolition will be abandoned in accordance with Maine Department of Health and Human Services ("Maine DHHS") 144A CMR 232 Chapter 7. This regulation requires that any such work be performed by a licensed Master Well Driller employed by a well drilling company licensed in the State of Maine. A 'Well Abandonment Record', using the format established by the MDEP Bureau of Remediation and Waste Management, will be completed and signed by the licensed Well Driller. The water well abandonment operation will be witnessed by an inspector, on behalf of CMP, who will verify and document the following:

a. the depth and diameter of the well;
b. the type and volume of sealing material used;
c. that the grout slurry has been mixed and used in accordance with manufacturer specifications; and
d. that the abandonment procedures used, including volume of material used, incidences of bridging, corrective actions taken, and end results are all compliant with CMR 232 Chapter 5.

Well abandonment will begin by opening the well casing and removing submersible pumps, liner pipes, and any other equipment other than the casing. The well depth will be obtained from the information recorded on the casing or pressure tank, or by direct measurement. The theoretical volume of required grout or bentonite fill material will be calculated based on the measured or recorded dimensions of the well hole and used to fill the casing pipe. Theoretical and actual volumes of fill material will be recorded in the Well Abandonment Record. The well casing will be cut off to the elevation to which the casing is

backfilled, approximately 18 to 24 inches below grade. Clean fill will be used to bury the casing and the disturbed area will be seeded.

The completed Well Abandonment Record and the report of the inspector will be furnished to the MDEP Project Manager, if so requested.

7.6.2.3 Groundwater Protection

The NECEC Project will not significantly alter existing surface water drainage characteristics. Groundwater recharge characteristics will not be permanently affected by the installation of the new transmission line. Temporary impacts to surface water drainage may occur during construction however these impacts will be short-term and limited to construction areas.

Surface water drainage may be slightly altered in limited areas due to construction of the Merrill Road Converter Station, Fickett Road Substation, and the West Forks and Moxie Gore Termination Stations. This alteration is addressed in the Stormwater Management Reports for each of these facilities (Attachment M). The substation yards (designed with layers of stone and gravel) will not increase stormwater runoff above pre-existing conditions; therefore, groundwater recharge will not be significantly affected by the substation construction.

7.7 Protected Species

For the purposes of this CWA Section 404 application, the discussion of potential impacts, avoidance, minimization and mitigation measures are for only those species that are federally protected, as described below. The State record demonstrates a thorough analysis of impacts, extensive consultation with the MDEP and MDIFW, and the incorporation of minimization and mitigation measures for state protected species and species of special concern.

7.7.1 Small Whorled Pogonia

Most of the NECEC Project involves work within existing cleared transmission line corridors and, therefore, there is limited potential habitat along the Project route for forest species such as the federally threatened small whorled pogonia. The forested portion of the HVDC line ROW between the Maine/Canada border and Wyman Hydro had not been previously surveyed by CMP for rare, threatened or endangered plants, however, during a June 7, 2017 consultation meeting with CMP, USFWS and MNAP, Don Cameron of MNAP suggested that the northern portion of the Project is not an area that has a high occurrence of documented rare plant species and that the undeveloped portion of the HVDC route is a working commercial forest that is routinely disturbed by harvesting activities. Further, CMP and the consulting agencies agreed that past survey efforts were sufficient for general rare plant surveys, however new targeted surveys should be performed in areas in Segment 3, between Jay and Lewiston, where habitat modeling completed by MNAP predicted the potential presence of small-whorled pogonia (*Isotria medeoloides*).

Surveys were conducted per the MNAP protocol to account for potential small-whorled pogonia habitat areas (Appendix E of the NECEC Rare Plant Survey Narrative Report (Attachment K)) A single non-flowering, but quite robust individual was identified within a total of 8 miles of targeted search areas. The occurrence was located west of the south end of Allen Pond, in Greene, Maine. The plant was growing on a relatively steep northeast-facing embankment of a small intermittent stream within an Oak-Pine Forest community. This location is approximately 87 feet west of the existing powerline ROW clearing. The NECEC will have no effect on the occurrence of the small-whorled pogonia in the adjacent wooded area to the existing transmission line corridor for the reasons described below.

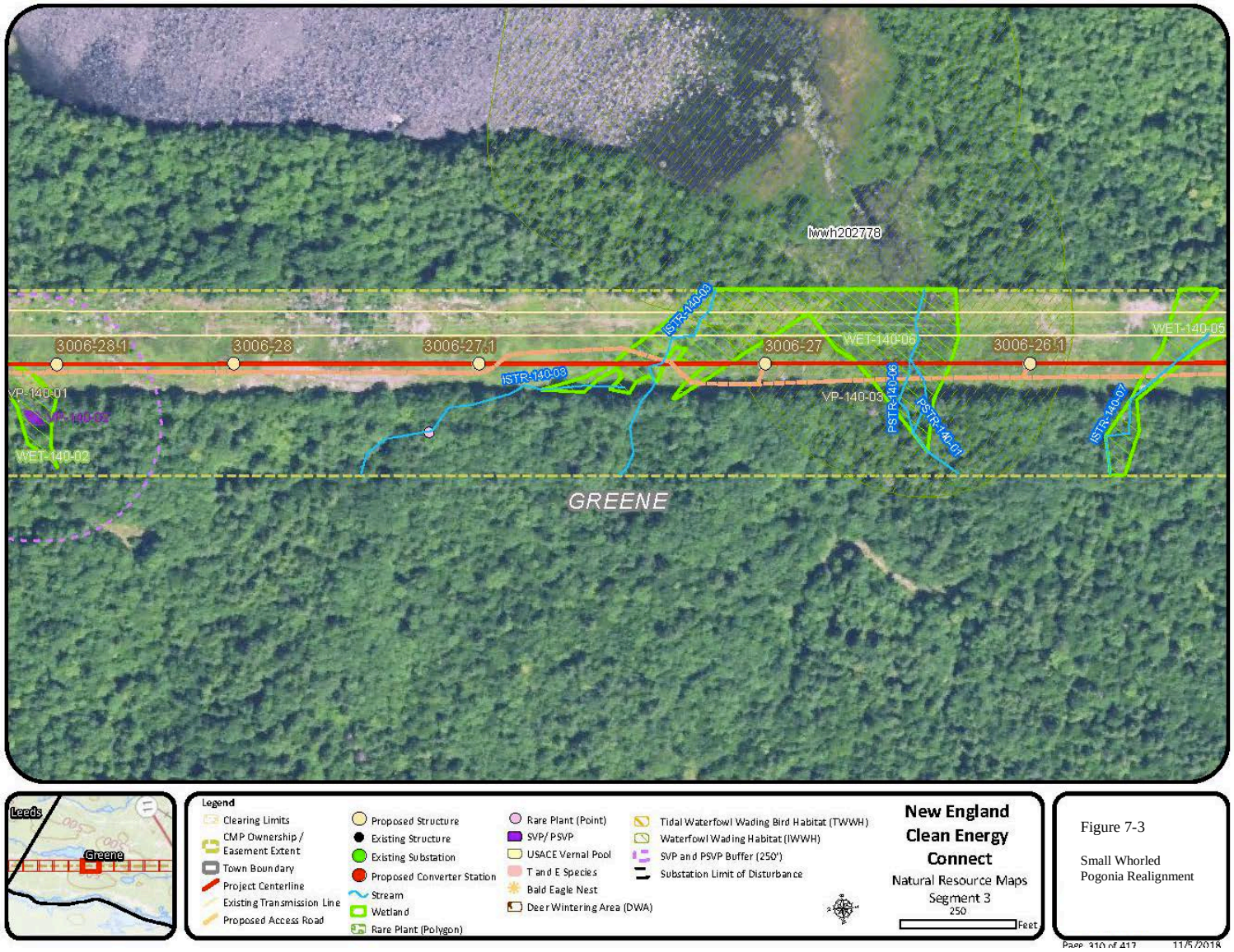
7.7.1.1 Clearing

As originally proposed in the 2017 state and federal permit applications, tree clearing would have occurred within approximately 12 feet of this small whorled pogonia occurrence. The single plant located outside the clearing limits would therefore not have been directly impacted, however indirect impact from

tree clearing was possible due to the potential additional sunlight intrusion. In an October 3, 2018 meeting between CMP, USFWS and MNAP, Don Cameron of MNAP indicated that any amount of tree clearing in this vicinity could potentially imperil the occurrence due to the altered habitat conditions when the tree canopy is removed. He also noted that transplanting was not a practical solution due to the existing microclimate, and because the small whorled pogonia is dependent on site-specific soil conditions, fungus, and association with adjacent trees.

CMP proposed an engineered solution, re-aligning the transmission line within the existing corridor to eliminate need for tree clearing and associated impacts on the small whorled pogonia (See Figure 7-3). Shifting the transmission line and eliminating clearing in the vicinity of the occurrence will avoid any direct or indirect impact to the species. CMP has also committed to implement yearly monitoring for the first three years following construction and every three years thereafter to support the data collection effort of USFWS and MNAP.

Figure 7-3 Small Whorled Pogonia Realignment



7.7.1.2 Equipment Access

Temporary access roads will be used to gain access to the structure locations and will be constructed in accordance with CMP's Environmental Guidelines. If necessary, timber mats will be used in wetlands or saturated areas and erosion and sedimentation controls will also be maintained consistent with these guidelines. The small whorled pogonia occurrence is located outside the proposed clearing area in a wooded portion of CMP's transmission line corridor. The closest temporary access road is located in the existing cleared corridor, approximately 130 feet from the occurrence. No vegetation removal will be required for construction access in this location and equipment access will therefore not impact the small whorled pogonia occurrence.

7.7.1.3 Impacts from Structure Installation

The nearest structure is located approximately 185 feet from this small whorled pogonia occurrence. No vegetation clearing will be required for the installation of the new structure. Temporary impacts from installation of this steel monopole structure is approximately 7,854 square feet. Permanent impacts associated with the structure will be approximately 40 square feet. Erosion and sedimentation controls will be installed in accordance with CMP's Environmental Guidelines to minimize the potential for soil movement or stormwater runoff from exposed areas. Structure installation in this location will not have an impact on this small whorled pogonia occurrence.

7.7.1.4 Restoration

Once construction is complete, construction related materials will be removed, access roads will be restored and disturbed areas will be graded to pre-construction contours. Temporary erosion controls will remain in place until the disturbed site(s) are fully stabilized with vegetation. The ROW will be maintained in an early successional scrub-shrub condition, as it currently is. Restoration activities will not impact this small whorled pogonia occurrence.

7.7.1.5 Long Term Operation and Maintenance

CMP's transmission line corridor maintenance practices will encourage the growth of herbaceous and scrub-shrub vegetation that will not present safety or electrical reliability problems. The corridor near this small whorled pogonia occurrence will be maintained in its current condition, consistent with the requirements described in the VMP.

Trees within the corridor that have the potential to grow up into the conductor safety zone (e.g. capable species) will be removed for safety and reliability reasons. CMP will use a selective herbicide program to treat areas once every four years to maintain an early successional (i.e. scrub-shrub and herbaceous) stage

of vegetation. All herbicide usage will be in compliance with all label requirements and standards established by the Maine Board of Pesticides Control ("MBPC"). Herbicides will be selectively applied to capable species, using low-pressure (hand-pressurized) backpack applicators, to prevent growth of individual capable specimens and to prevent regrowth of cut capable specimens. Individual capable specimens will be treated with herbicides, and no broadcast application will be done. Applications of herbicide will be prohibited when wind speeds exceed 15 MPH to minimize drift. CMP will not use herbicides within 25 feet of any waterbody or standing water. Only trained applicators working under the supervision of MBPC-licensed supervisors will apply herbicides. Herbicides will be applied only during periods when potential for rain wash off is minimal.

The continued removal of capable vegetation and selective use of herbicides on the adjacent existing transmission line corridors will not pose a threat to this small whorled pogonia occurrence.

7.7.1.6 Conclusion

An engineered solution proposed by CMP has eliminated the need for tree clearing and associated impacts in the vicinity of the occurrence. The proposed shifting of the transmission line and elimination of tree clearing in the vicinity of the occurrence will avoid any direct or indirect impact to this specimen. As a result, adverse effects to small whorled pogonia are not expected.

7.7.2 Atlantic Salmon

Impacts to Atlantic salmon populations, and fishery resources in general, will be minimal for the NECEC Project. Potential Atlantic salmon habitat occurs within a number of water bodies crossed by the NECEC Project, primarily located in Segments 3, 4 and 5. No waterbodies in Segment 2 and only six waterbodies in Segment 1 of the Project are located in designated critical habitat and none of the six has been identified as Atlantic salmon habitat by ME DMR (Bruchs, 2017).

With the exception of culvert removals and replacements intended to improve habitat quality and connectivity proposed as part of CMP's Compensation Plan (further discussed in Section 9.0), the Project will have no direct impact (i.e., in-stream construction) on Atlantic salmon habitat. Potential indirect impacts to Atlantic salmon habitat include increased stream insolation due to tree removal, sedimentation and turbidity, and the introduction of pollutants from construction-related activities. All are factors that could negatively impact biological communities in Atlantic salmon critical habitat.

The following sections provide a descriptive overview of each activity, the possible effects to the Atlantic salmon habitat and the physical and biological components of that habitat, and the avoidance, minimization and mitigation measures that will be implemented to reduce or eliminate potential impacts.

7.7.2.1 Clearing

All riparian buffers will be appropriately flagged with distinct flagging prior to the commencement of clearing. Capable vegetation (those woody plant species and individual specimens that are over 10 feet in height and are capable of growing into the conductor safety zone) will be removed and controlled within the NECEC Project area. In Segment 1, a new 150-foot-wide corridor will be established, and vegetation will be cleared in accordance with CMP's VCP. Segments, 2, 3, 4, and 5 will be co-located within an existing transmission line corridor and necessary clearing has been minimized to generally 75 feet of additional corridor width and, in some locations (primarily Segments 4 and 5), there will be minimal or no new clearing necessary. Tree clearing will occur for development of the substation sites, however none of these is adjacent to known or potential Atlantic salmon habitat streams. Potential indirect impacts related to tree clearing adjacent to Atlantic salmon habitat include sedimentation and turbidity, introduction of pollutants, and stream insolation.

Sun exposure on smaller water bodies can result in a negative impact due to an increase in water temperature (insolation), which can pose problems for cold water fisheries. A.M. Peterson (1993) has reported that the removal of tree canopy (on new transmission line corridors) increases stream insolation during the short term, but within two years the areas are bordered by dense shrubs and emergent vegetation and water temperatures are not significantly higher than upstream forested reaches. The VCP requires that capable species, or trees within the corridor that have the potential to grow up into the conductor safety zone be removed, however throughout clearing and construction, shrub and herbaceous vegetation will remain in place to the extent practicable. The VCP also establishes a 100-foot riparian buffer, as measured from the top of each bank, for all streams identified as Atlantic salmon habitat along the transmission line corridor. To further mitigate the potential impacts of insolation and provide shading, CMP will allow non-capable species exceeding 10 feet in height to remain within the stream buffer and outside the wire zone, unless it is determined that they may encroach into the conductor safety zone prior to the next four year maintenance cycle. Inside the wire zone, all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut to ground level to maintain the Minimum Vegetation Clearing Distance ("MVCD" or conductor safety zone), as well as safety and reliability of the transmission line. See Figure 7-4 for Typical Vegetation Maintenance Detail.

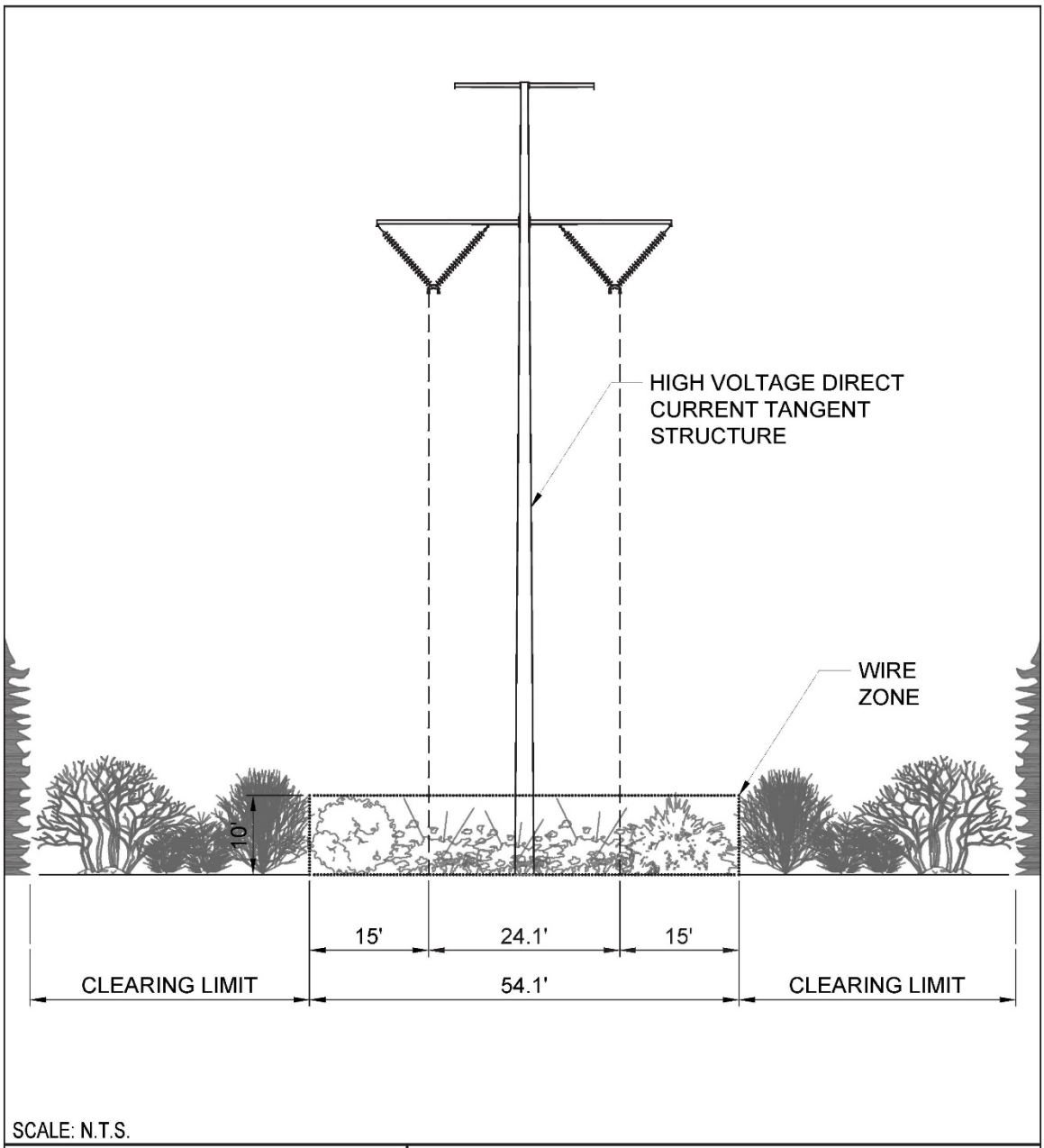
Potential sedimentation associated with soil disturbance from equipment use and vehicle access can result in temporary short-term impacts to fishery resources. Sedimentation can result in reduced light penetration, smothering of aquatic feeding and spawning areas, and impairment of aquatic respiration. Sedimentation can also impact the quality of fish habitat in water bodies by increasing the level of substrate embeddedness[30] reducing habitat complexity and altering stream channels. To avoid these problems, CMP will implement its Environmental Guidelines during the construction of the NECEC to minimize the potential for erosion and sedimentation and to protect fishery resources.

Additionally, more stringent restrictions apply to vegetation clearing within the 100-foot stream buffer to minimize erosion and sedimentation and impacts to water quality, also described in more detail in Section 4.1 of the VCP. Initial clearing will occur during frozen ground conditions whenever practicable to minimize soil disturbance and to preserve non-capable vegetation. If not practicable, the recommendations of the environmental inspector will be followed regarding the appropriate techniques to minimize disturbance such as the use of selectively placed travel lanes within the stream buffer. Removal of capable vegetation, dead or hazard trees within the buffer will typically be accomplished by hand cutting. However, if necessary, mechanized harvesting equipment will be used if supported by construction matting. To further minimize these potential sedimentation impacts from clearing activities, CMP will install appropriate sedimentation controls as outlined in CMP's Environmental Guidelines.

To protect water quality, foliar herbicide use will be prohibited within the 100-foot buffer and all refueling/maintenance of equipment will be excluded from the buffer unless it occurs on an existing paved road or if secondary containment is used with oversight from an environmental inspector.

Potential impacts to Atlantic salmon and its designated critical habitat have been minimized through the siting the much of the Project within existing corridors, establishing more stringent restrictions and protections within a 100-foot riparian buffer associated with potential Atlantic salmon habitat, and the implementation of erosion and sedimentation controls to protect these water bodies, and therefore the impacts associated with tree clearing activities will be minimal.

[30] Substrate embeddedness is defined as the extent to which larger particles are buried by finer sediments (MacDonald et al. 1991).



SCALE: N.T.S.

CENTRAL MAINE POWER COMPANY

CENTRAL MAINE POWER

VEGETATION MAINTENANCE -
HIGH VOLTAGE DIRECT CURRENT
TANGENT STRUCTURE DETAIL

Figure 7-4

7.7.2.2 Equipment Access

All equipment crossings are temporary, completely span each stream, and will be constructed and maintained in a manner that will prevent sediment from entering water bodies. Additionally, CMP will follow its Environmental Guidelines, which contains effective and proven erosion and sedimentation control BMPs that will be used to protect soil and water resources during construction of the various NECEC Project components.

Construction of the NECEC will require temporary equipment access across certain water bodies to perform the necessary clearing and to reach pole locations and site developments associated with new substation construction. CMP has designed access routes to minimize the number of crossings that will be required and has avoided the crossing of larger water bodies where possible. Where crossing a water body or stream is necessary, CMP has outlined detailed measures that minimize potential sedimentation and turbidity associated with equipment crossings, which can be viewed in detail within the Environmental Guidelines. CMP will utilize existing access roads where feasible to minimize disturbance; and where practicable, access road approaches and temporary equipment spans have been designed to cross water bodies in a perpendicular fashion to limit the disturbance of vegetation and soils immediately adjacent to water bodies.

Temporary equipment bridges (See Section 7.4.2, Figure 7-2), also known as equipment spans, are the preferred method for access when it is necessary to cross waterbodies or streams. Bridge construction minimizes potential disturbance to the waterbody bed and banks. Most bridges can be quickly removed and reused without significantly affecting the stream or its banks and without interfering with fish migration or spawning areas. The guidance for positioning and installing bridges outlines three factors: (1) access roads will cross streams at right angles to the channel at a location with firm banks and level approaches (whenever possible); (2) abutments will be placed at an appropriate grade on firm ground such that existing stream banks do not become compromised; and (3) the temporary access road approach to all equipment bridges will be stabilized with construction mats or large angular stone and runoff will be directed away from the equipment bridge/waterbody into appropriate erosion and sedimentation controls. All equipment bridges and approaches will be routinely cleaned of accumulated sediment deposited by construction traffic and removed sediment will be placed in an upland area to prevent its introduction into a waterbody. Erosion and sedimentation control methods will also be implemented where ground disturbance is adjacent to wetlands and waterbodies.

Culvert Removals and Replacements

Temporary access road construction will not require the use of temporary or permanent culverts for crossing streams during construction, however, as part of the NECEC Compensation Plan, CMP has proposed a Culvert Replacement Program (See Section 9.0, Exhibit 9-11), in order to improve the habitat connectivity of coldwater fisheries in a number of locations with improperly installed, undersized, or damaged culverts. The proposed program consists of two primary components: 1) during construction activities, within the Project ROW and along unimproved project access roads (e.g. off-corridor logging roads to be used for construction access), CMP will replace existing culverts found to be damaged, installed improperly, or non-functioning, consistent with Stream Smart Principles to improve or maintain habitat connectivity, and 2) CMP will dedicate $200,000 to replace culverts on lands outside of CMP's ownership. CMP proposes to work with MDEP, MDIFW and interested environmental non-governmental organizations to grant this money to appropriate entities that can identify those culverts most beneficial to replace, and to manage and oversee their replacement. Culvert projects and the entities that will utilize the funding have not been identified at this time. However, entities that utilize the funding will be allowed to do so only upon the appropriate level of Section 7 consultation with the USFWS and the subsequent receipt of any required permits from the USACE and MDEP.

For culvert replacements on CMP-controlled lands or along unimproved access roads used for construction access, CMP will replace or remove all culverts that are deemed to be barriers to fish passage, including within transmission line corridors, mitigation parcels and access easements held by CMP. Culverts will be evaluated during pre-construction walkovers with the contractor(s), CMP environmental inspector, construction inspector, and MDEP third-party inspector. CMP will develop a field variance process, in cooperation with the MDEP and USACE, to allow for the informal review and approval of minor modifications during Project construction. Culvert replacements will be consolidated into batches and submitted as a field variance request for review and approval prior to implementation. Field variances will be packaged and included for formal approval through a future permit revision application. No removals or replacements will occur in waterbodies that have potential or known Atlantic salmon habitat unless the field variance is approved, which will be subject to review and comment by USFWS prior to the USACE's approval. It is anticipated that culvert removals or replacements proposed by the Applicant will result in Atlantic salmon habitat enhancement.

A CMP environmental inspector will be present to monitor all culvert removals and installation procedures and will follow the *Culvert Installation Methodology* and *Culvert Removals and Stream Restoration* guidance in the Culvert Replacement Program (Section 9.0, Exhibit 9-11). CMP will

document each culvert replacement or removal and will submit a summary report for condition compliance to the MDEP and the USACE following construction. CMP will monitor the conditions of replaced culverts for a period of 1 year following construction and will report any deficiencies and recommended corrective actions to the MDEP and USACE.

7.7.2.3 Impacts from Structure and Underground Installation

The transmission line has been designed to site structures outside of stream buffers to the maximum extent practicable. For known or potential Atlantic salmon streams no new structures will be installed in or within 100 feet of a stream crossing, unless specifically authorized by the MDEP and accompanied by a site-specific erosion control plan. The expanded protective buffers will minimize the potential for erosion or sedimentation to occur during structure installation. The installation of erosion and sedimentation controls at structure locations adjacent to Atlantic salmon waterbodies will proceed prior to site disturbance associated with structure installation. Environmental inspectors will routinely monitor the erosion and sedimentation controls. Erosion and sedimentation controls will be maintained and not removed until the environmental inspector has confirmed that the area has been revegetated or otherwise stabilized. In this manner, proper installation and maintenance of erosion and sedimentation controls in combination with the vegetated riparian buffer strip, adverse effects to Atlantic salmon from sedimentation associated with structure installation will be avoided.

The NECEC Project includes an HDD crossing beneath the Upper Kennebec River, between West Forks Plantation. and Moxie Gore. The HDD bore will extend underground approximately 3,000 feet from the Moxie Gore Termination Station on the east side of the Kennebec River to the West Forks Termination Station on the west side of the river. Approximately 1,450 feet of forested buffer on the east side and 1,160 feet of forested buffer on the west side riverbanks and adjacent uplands will be retained. The depth of the HDD bore beneath the riverbed will range from approximately 55 to 75 feet and will follow the construction plan and phases as described in Section 5.4.

As discussed in Section 5.4, the HDD process uses a drilling fluid composed of water and clay particles consisting of bentonite. The main component of bentonite is montmorillonite clay, which has a high shrink-swell capacity. The bentonite and water work together to lubricate and cool the drill head, seal and fill pore spaces surrounding the hole, and prevent the drill hole from collapsing. It also suspends the cuttings of the native material and removes them. During the HDD process there is a small potential of drilling fluids reaching the ground surface by following a vertical bedrock fracture, and thereby the potential of a release to the Upper Kennebec River if this unlikely situation were to occur. The Requirements for Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan (“HDD

Contingency Plan") (Attachment L) outlines the details of the HDD process, the monitoring and prevention procedures, and the measures that would be in place to respond to an inadvertent release of drilling fluids for both land and aquatic scenarios.

The Upper Kennebec River at the point of the HDD crossing is not within the Atlantic salmon critical habitat and does not contain known or potential Atlantic salmon habitat, however the Biological Assessment looks at the Action Area, defined in 50 CFR Part 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The Action Area also includes the distance that sediment plumes can travel within a waterbody resource, and the distance that each fish species can travel through the entire body of water associated with a segment.

As described in Attachment L, the HDD Contingency Plan includes monitoring along the drilling path and downstream of the drilling path, including on the river. The HDD Contingency Plan will include procedures for continuous monitoring of loss or reduction of circulation of drilling fluid and response procedures in the event a problem is detected. The HDD Contingency Plan will also describe river low-flow and high-flow conditions and how release monitoring will be coordinated with and will occur during low river flow conditions. The HDD Contingency Plan will document the communication process such as chain of command, responsible parties, reporting and remediation time frames.

Drilling fluid is heavier than water and is typically released at low velocities and settles in low areas. The HDD Contingency Plan will detail how to place barriers around a release in the river, how to divert the river flow away from the release site, how to create a sump within the river diversion, how to pump the release fluid out of the sump, how to collect and transport fluid for disposal, how the inadvertent fluid release site is restored, and how the river diversion is removed. The HDD Contingency Plan will also include an inspection of the riverbed a minimum of 500 feet downstream from the fluid release site to look for pockets of slower moving water where drilling fluid may have been collected.

The nearest location where Atlantic salmon critical habitat is mapped for this waterbody segment is upstream of the confluence of the Kennebec and Carrabassett Rivers in Anson, approximately 41 miles downriver of the HDD site. It is unlikely that with the close monitoring and timely response procedures in place, along with the low-velocity physical properties of the drilling fluid, and the significant distance any remaining sediment must travel before reaching potential Atlantic salmon habitat, that there will be an impact to Atlantic salmon habitat. Additionally, the Wyman dam impoundment is located approximately 25 miles downstream of the HDD site and if any measurable suspended sediment was not captured by the response efforts, the dam would block any remaining sediment transport. For these reasons, in the

unlikely event of a drilling fluid release from the HDD activity, it is not likely to affect Atlantic salmon or its critical habitat.

7.7.2.4 Restoration

Upon the completion of construction in either a given area or for the entire Project, CMP or a designated representative, the contractor, or a third-party inspector will review the Project's restoration needs and prioritize areas. All wetland and waterbody crossings will be restored to natural conditions, and any material or structure used at temporary crossings will be removed, and the banks will be stabilized and revegetated consistent with CMP's Environmental Guidelines.

7.7.2.5 Long Term Operation and Maintenance

CMP's VMP outlines parameters for vegetation maintenance within stream buffers. A 100-foot buffer, as measured from the top of each stream bank, will be established for vegetation maintenance for designated cold-water streams including all streams that contain potential Atlantic salmon habitat. Vegetation maintenance in the stream buffer areas will consist of only removing those species that are capable of growing into the conductor safety zone within the next maintenance cycle (i.e., within the next four years), which will be cut back to ground level. No other vegetation, other than dead or hazard trees, will be removed. Any capable, dead, or hazard trees within the stream buffer will be removed by hand-cutting methods only, and no slash will be left within 50 feet of any stream edge. To protect water quality, no foliar herbicides will be used within the 100-foot buffers associated with Atlantic salmon habitat. Additionally, no fueling, mixing, or transferring of fuel will occur within 100 feet of the stream unless done so on a paved public road. Otherwise, stream-side vegetation will not be disturbed during future vegetation maintenance activities. As noted earlier, no herbicides will be applied within Project Segment 1.

7.7.2.6 Conclusion

There is no proposed instream activity related to the clearing and installation of transmission line structures and substation site development. Access across streams will be entirely spanned with temporary equipment bridges constructed and maintained in a manner to minimize the potential for sedimentation and turbidity. Environmental controls will be implemented to avoid and minimize the potential for water quality degradation associated with soil erosion and sedimentation and other pollutants. Replacements of culverts will enhance and restore habitat that will be beneficial to Atlantic salmon. Construction of the Project as proposed is not expected to have adverse effects on Atlantic salmon or its critical habitat.

7.7.3 Canada Lynx

The proposed transmission corridor in the northern section of the NECEC Project between Beattie Township and Johnson Mountain Township is located in the critical habitat area, a very remote, predominantly forested area which is heavily managed for commercial timber production. As shown on Figure 4-2 in Section 4.7.3.3, the USFWS has identified a Section 7 review area that includes the Canada lynx designated critical habitat and most of northern Maine. The Section 7 review area, beyond the boundary of the designated critical habitat, includes Segments 1, 2, and portions of Segment 3 of the Project between Johnson Mountain Township and the Town of Embden. The southern limit of the Section 7 review area extends to a location near Town Road in Embden.

Jennifer Vashon, Black Bear and Canada Lynx Biologist from the MDIFW, provided lynx occurrence data that include 197 observation points for the MDIFW (email between Jennifer Vashon of MDIFW and James Morin of Burns & McDonnell 12/27/2018). The northernmost data point includes a January 2012 sighting approximately 34 miles north of the Project corridor located along the Golden Road. The southernmost data point, which occurred within 1.5 miles of the Project corridor, includes a February 2010 sighting in the Town of Starks. An “incidental take” by vehicle collision was also recorded in September 2007 along Route 2 in Palmyra, approximately 27 miles east of the Project corridor. As shown on Figure 4-2, within the designated critical habitat area, two sightings were noted in 2005 within one-half mile of the Project corridor approximately three miles from the Canada border, 10 sightings (one recorded in 1975) were recorded within five miles of the middle section of the northern portion of the Project corridor (south and east of Whipple Pond), and 15 sightings were recorded within five miles of the Project corridor east of Route 201. There are 14 occurrence data points within five miles of the Project corridor, located beyond the critical habitat, within the Section 7 review area extending to the southernmost occurrence in Starks.

Over the past 100+ years a majority of the landscape directly adjacent to and including the northern sections of the NECEC Project have undergone repeated timber harvest operations, which directly affects the habitat of many wildlife species. A recent study suggests that habitat suitability for the Canada lynx is more affected by habitat loss, which is defined as a reduction in the amount of suitable habitat, than habitat fragmentation, which involves the breaking apart of habitat independent of habitat loss, and that the instances of use are flexible and dependent on landscape conditions (Hornseth et al., 2014). The study further states that lynx may modify their choice of habitat depending on local conditions, thus lowering their sensitivity to habitat alterations caused by humans.

According to the Canada Lynx Conservation Assessment and Strategy report (Interagency Lynx Biology Team, 2013), utility corridors can have both short and long-term impacts to lynx habitats. One effect is the disturbance to the connectivity of lynx habitat. When located adjacent to highways and railroads, utility corridors can further widen the ROW, thus increasing the likelihood of impeding lynx movement. However, remote narrow utility corridors may have little or no effect on lynx and may enhance habitat in certain vegetation types and conditions. The NECEC corridor, which will be cleared to a width of 150 feet within Canada lynx habitat, is not directly abutting other linear features. Once constructed, the corridor will be allowed to revegetate to early successional (scrub/shrub) habitat therefore making it unlikely to impede lynx movements. In fact, as a remote transmission line the NECEC may promote a travel corridor for safe movement and provide habitat connectivity to Canadian lynx populations.

The lynx ability to survive and thrive in this region is also heavily dependent on the availability of their primary food source, the snowshoe hare. The U.S. Fish and Wildlife Service October 2017 Species Status Assessment for the Canada Lynx Continuous United States Distinct Population Segment states that "although forest types and the effects of forest (vegetation) management vary geographically, hare abundance throughout the DPS range is strongly correlated with a single common denominator – dense horizontal cover at ground and snow level. Such cover provides hares with a source of browse, protects them from predation, and is the most important structure characteristic for hares throughout their range." (USFWS 2017.) CMP manages vegetation in its corridors in a manner that promotes early successional growth that would typically be found in the Project corridor shortly following construction of the Project.

A study completed by Brocke et al. (1993) for the United Stated Department of Agriculture ("USDA") Forest Service indicated that the causes of lynx extirpation in the White Mountain National Forest in New Hampshire was the result of losses from highway kills, along with trapping and loss of habitat. Recent studies have not been conducted to assess traffic volume, and their effect on lynx mortality and dispersal. However, recent research on other carnivores on highways in Canada suggests that highway traffic volumes of 2,000 to 3,000 vehicles per day may be problematic due to a higher incidence of animal collisions. Traffic volumes of 4,000 vehicles or more per day create more serious impacts in terms of mortality and effective fragmentation (Ruediger, et al., 2000).

The Canada Lynx Assessment by Vashon et al. (2012) states that 27 lynx were killed when struck by vehicles in Maine between 2000 and 2011, of which approximately fifteen were struck on dirt roads used for logging activity. The report continues to state that "although roads do not appear to limit the core lynx population in Maine, high speed/traffic roads may limit the lynx ability to colonize new area. Future construction or improvements to existing roads that increase traffic volumes and speeds (i.e., paved and

maintained roads) in lynx range could result in increased vehicle collision with lynx." It is important to note that any increases in traffic volumes caused by the Project will be minimal and temporary in nature, and that speeds on logging roads will not increase as a result of the Project. All Project personal will be instructed to obey posted speed limits and generally reduce speeds when driving on logging roads to minimize potential impacts to Canada lynx and other wildlife.

The Maine Department of Transportation ("MDOT") 2017 Traffic Volume Annual Report shows Annual Average Daily Traffic ("AADT") counts from years 2012 to 2017. In years 2012 and 2015 the AADT count for U.S. Route 201 at Parlin Pond Township. town line was 1,660. This monitoring station is located within the Canada lynx designated critical habitat area and within one mile of where the Project corridor crosses U.S. Route 201. The traffic count numbers reported by the MDOT for this monitoring location are well below the numbers stated as "problematic" in the Ruediger article. It is reasonable to assume that traffic counts along secondary roads and logging roads would be considerably less than what is reported by the MDOT for this U.S. Route 201 monitoring location (MDOT 2017), and thus the slight and temporary increase in traffic generated by the construction and operation of the Project would have no additional effect on lynx mortality.

7.7.3.1 Clearing

As shown in Figure 4-2, the USFWS Section 7 review area is a much broader area than the designated critical habitat. Approximately 3,411 acres of the Project area is in the Canada lynx expanded Section 7 review area, of which only 1,617 acres are located in designated critical habitat. Of the 3,411 acres of Project corridor in the Section 7 review area, only 1,107 acres will be cleared, 700 acres of which are in the designated critical habitat. The cleared ROW from the Canada border in Beattie Township to just south of Lake Moxie Road in East Moxie Township will be 150 feet wide. Once the Project enters the existing corridor just south of Lake Moxie Road, the additional clearing will only be 75 feet wide.

To further quantify the impacts of clearing on snowshoe hare/Canada lynx habitat, the forested corridor in both the designated critical habitat and the Section 7 review area were delineated based on forest stand types. Forest stand maps provided by Weyerhaeuser, a private forest and land management company, and 3D color aerial photo interpretation were used to delineate and map the forest into stand types. Determination of the forest stands was based on evidence of hardwood species verses softwood species, evidence of forest management practices, and visual observations of tree size, structure, and forest densities. Table 7-3 below defines how the forest stand types were categorized and quality groups assigned.

Table 7-3: Forest Stand Code Characterization

Forest Stand Types		
S	Softwood	>75%
H	Hardwood	>75%
SH	Mixed (heavy to softwood)	>50% Softwood
HS	Mixed (heavy to hardwood)	>50% Hardwood
NP	Non-Productive	water, open wetlands, woodyard, gravel pit, rock slope, roads, agricultural field, utility lines, etc.
Forest Stand Age		
1	Clear Cut/Open Productive	0 years old
2	Seedling/New Stock	<12 years old
3	Sapling/Young Stock	12-26 years old
4	Pole Timber/Growing Stock	26-40 years old
5	Saw Timber/Mature Stock	>40 years old
Forest Stand Structure/Density/Crown Closure		
A	Open/No-Stocking	<20%
B	Semi-Open/Low Stocking	20-50%
C	Medium/Moderate Stocking	50-80%
D	Dense/High Stocking	>80%
Quality Groups (categories) for lynx and their critical habitat		
Current	High Quality Snowshoe Hare Habitat	S3C, S3D, S4C, S4D, SH3C, SH3D, SH4C, SH4D
Future	High Quality Snowshoe Hare Habitat	S1A, S2A, S2B, S2C, S2D, S5C, S5D, SH2C, SH2D, SH5C, SH5D
Matrix	Low Quality or Not Ideal Snowshoe Hare Habitat	All H and HS, and remaining low stocking A & B stands
Other	Non-Productive Land	NP

Based on consultation with Mark McCollough of USFWS (email between Mark McCollough of USFWS and James Morin of Burns & McDonnell, 11/6/2018), current high-quality snowshoe hare habitat consists of dense, young (12 - 40-year-old), predominantly mixed wood (>50% softwood) or pure softwood stands (>75%), primarily spruce-fir types. These stand codes include S3C, S3D, S4C, S4D, SH3C, SH3D, SH4C, and SH4D. Future high-quality snowshoe hare habitat would be all other predominantly (>50%) mixed wood or pure softwood (spruce/fir types) stands <12 years old (new clear-cuts, formerly softwood, expected to regenerate to softwood), and >40 years old (mature softwood stands that may also include cedar-dominated forest). These stand codes include S1A, S2A, S2B, S2C, S2D, S5C, S5D, SH2C, SH2D, SH5C, and SH5D. Matrix forest, which would be low quality or not ideal snowshoe hare habitat would include mixed forest (<50% softwood) and pure hardwood stands, regardless of age and structure. These stand codes would include all H and HS, and any other low stocking stands (A and B). Non-productive stands are coded as NP, and include roads, open wetlands, gravel pits, and woodyards.

In addition, point location data for lynx occurrence provided by Jennifer Vashon of MDIFW helped determine the southernmost town to map forest stands and conduct the lynx habitat analysis beyond the limits of the Section 7 review area. The data provided by the MDIFW show that the southernmost town where a lynx sighting occurred was Starks in 2010. The notes for the data point state that it "crossed Route 43 in Starks and headed across a hayfield to a patch of woods." There is no point location data south of Starks.

Using the forest stand data, current and future high-quality snowshoe hare habitat make up only 36% of the Project corridor (approximately 493 acres of 1,355 acres) from the Canada border to the Town of Starks. The breakdown of current and future high-quality snowshoe hare habitat acreage within the critical habitat, the portion of Section 7 review area located outside of the critical habitat area, and the area south of the Section 7 review area are shown in the Table 7-4 below.

Table 7-4: Summary of High Quality Snowshoe Hare Habitat

	Current High Quality Hare Habitat	Future High Quality Hare Habitat	Total Hare Habitat (current + future)	Matrix Habitat (all other forested habitat)	Non-Habitat (roads, gravel pits, open wetlands, etc.)	Total
Critical Habitat	177.3	101.7	279.0	462.6	31.2	772.8
Section 7 Review Area (outside Critical Habitat Area)	112.6	79.9	192.5	236.3	15.9	444.7
South of Section 7 Review Area to Starks	16.7	4.6	21.3	98.1	18.5	137.9
Total	306.6	186.2	492.8	797.0	65.6	1,355.4

Research indicates it is unlikely that the creation of 150-foot transmission corridor will negatively affect Canada lynx or snowshoe hare habitat and both species may benefit from the creation of a varied successional landscape and an edge effect for hunting or foraging (Ruediger, et al., 2000).

In an email dated 5/31/2018 to Wende Mahaney of USFWS and Jay Clement of USACE, Mark McCollough of USFWS stated "Typically, we consider the construction (clearing of the rights of way and potential access roads) and existence of a cleared (revegetated) right of way to not have adverse effects on lynx themselves. The noise and activity associated with construction may have short-term, temporary effects on lynx behavior, possibly causing them to avoid some feeding areas, but they have large home ranges (as much as a township for males and 1/3 township for females) that provide alternate locations for feeding, sheltering, etc. while construction occurs. There may be a slight chance that construction during May and early June could affect female lynx and their dens. Lynx are known to relocate kittens when there is human activity, such as forest cutting. Project plans should specify whether construction will

occur during May or June in the aforementioned townships and what contingencies will be taken if female lynx acting unusually tame (typical behavior when around a den) or lynx kittens are encountered."

As a conservative measure, and in an effort to protect the lynx should an occurrence within the ROW be observed, contractors and subcontractors will immediately suspend all activity in the vicinity of the occurrence, immediately leave the area unless it poses a safety concern and notify project supervisors and environmental inspectors. Environmental inspectors will notify state wildlife officials prior to proceeding with construction. The environmental training provided to all Project personnel will include a discussion of these measures and any other specific protocols determined necessary for the protection of Canada lynx.

7.7.3.2 Equipment Access

Access to structure locations for the Project in the critical habitat area and structure locations south to Lake Moxie Road in The Forks Plantation will be in the newly cleared ROW. South of Lake Moxie Road all new structures will be co-located within existing CMP transmission line ROWs.

The NECEC corridor within the lynx critical habitat area and the Section 7 review area are in remote areas of the state with no major interstate highways or heavy vehicular traffic. The road network in this area consists of two-lane state or county roads and gravel logging roads. Construction of the NECEC Project will temporarily increase local traffic during construction, but construction activity will not be concentrated in a particular area for extended durations. While the likelihood of an impact to lynx mortality due to vehicular traffic is low, the Project will reduce this potential risk by minimizing night travel, as well as travel at dusk and dawn, when lynx are most active. CMP will also require environmental training for all personnel associated with the Project, which will include training related to appropriate speed limits and general awareness of the potential presence of this protected species.

7.7.3.3 Potential Impacts from Structure Installation

Once the ROW is cleared and the temporary access roads are in place for structure installation, the risk for interaction with the Canada lynx would be relatively low considering that the lynx is an elusive species that would likely avoid the noise and activity associated with structure installation.

7.7.3.4 Restoration

Once construction is complete and the wire is clipped into the poles, the restoration process will primarily include removing all construction related debris, removing mats from the access road, restoring any disturbed areas and installing temporary erosion controls. The temporary erosion controls will remain in place until the disturbed site(s) are fully stabilized with vegetation. CMP's objective is to allow the ROW

to revegetate to a natural, early successional state of scrub/shrub habitat that benefits a wide array of wildlife, while not interfering with the transmission line infrastructure. It is anticipated that it will take one to two years for the natural vegetation to fill in, thus having a short-term effect on the snowshoe hare's preferred dense scrub/shrub habitat. However, over the long-term, as the natural vegetation fills in and becomes denser, it will provide forage and cover that will benefit the snowshoe hare, which is directly correlated to the Canada lynx's ability to survive and thrive in the region.

7.7.3.5 Long Term Operation and Maintenance

In an email dated 5/31/2018 to Wende Mahaney of USFWS and Jay Clement of USACE, Mark McCollough of USFWS stated "Most rights of way are kept in a shrubby or young forest condition. This forest condition would facilitate the dispersal and movement of lynx across the right of way and may provide minimal value for feeding habitat."

CMP's plan is to maintain its transmission line corridors in a manner that encourages growth of non-capable, early successional, shrub and herbaceous vegetation that will provide important habitat and forage for a wide variety of wildlife species and be in accordance with the CMP VMP and CMP's Environmental Guidelines.

7.7.3.6 Conclusion

Habitat loss, habitat fragmentation, and reductions in habitat connectivity have been avoided and minimized through the co-location of 73% of the new Project transmission line within existing corridors and the proposed maintenance of early successional vegetation within the corridor. Modification of habitat associated with the maintenance of the corridor in early successional cover will not degrade habitat for snowshoe hare, the Canada lynx's primary food source. Increases in traffic volume will be minimal and temporary and Project personnel will be instructed to obey posted speed limits to minimize potential impacts to Canada lynx. For these reasons, the Project is not expected to have adverse effects on Canada lynx or its designated critical habitat.

7.7.4 Northern Long Eared Bat

As discussed in Section 4.7.3.4, the primary threat to bats is WNS, particularly in the northeast where some bat species populations have declined up to 99 percent (USFWS 2017). As described previously in this BA, the WNSZ includes the entire State of Maine and most areas of the eastern and midwestern United States. In 2011, it was discovered that bats at the three known hibernacula sites in Maine have visible signs of the WNS fungus on their wings and muzzles. This disease has been reported to cause 90 to 100-percent mortality in hibernaculum in other areas of the country.

The USFWS, under the 4(d) rule, has offered a streamlined consultation framework for the NLEB. This optional framework allows federal agencies to rely upon the USFSW January 5, 2016 intra-Service Programmatic Biological Opinion ("BO") in the Final 4(d) Rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the Project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if re-initiation of consultation is required per 50 C.F.R. § 402.16. The NECEC is eligible to utilize the streamlined Section 7 consultation if the Project occurs wholly outside the WNSZ or it is determined that the Project is not near, as defined above, any known hibernacula or maternity roost trees. The NECEC, which is located within the WNSZ but not near any known hibernacula or maternity roost trees. CMP intends to request streamlined consultation and will meet the provisions described in the "Optional framework to Streamline Section 7 Consultation for the Northern Long-eared Bat" form with submittal to the applicable agencies.

7.7.4.1 Clearing

The Project will involve 1,573 acres of forest conversion associated with tree clearing. The majority of tree clearing will occur within Segment 1, the 53.5 miles of undeveloped corridor between Beattie Township and The Forks Plantation. According to the BO, tree clearing in areas not near known hibernacula or known maternity roost trees is not a major contributor to the species decline, but because populations of bats are depressed by WNS, human activities that were not previously believed to be significant may be so now (USFWS 2017). In WNS affected areas, USFWS recommends, although does not require, an attempt to minimize tree removal during the maternity season when the pups are not able to fly and escape a falling tree. Maternity roost season occurs between June 1 and July 31 in Maine. Removal of trees outside this period, when most bats can fly and are more dispersed, is less likely to result in a direct injury or mortality. As a conservation effort to protect all federal and state protected bat species, the Project will suspend tree clearing activities during the maternity roost season of June 1 to July 31. Additionally, consistent with the VCP, initial clearing activities will be performed during frozen ground conditions, to the extent practicable.

7.7.4.2 Equipment Access

Equipment access roads will be established after initial tree clearing activities and will not pose a risk to the NLEB.

7.7.4.3 Potential Impacts from Structure Installation

Structure installation and construction will occur after initial tree clearing activities and will not pose a risk to the NLEB.

7.7.4.4 Restoration

Restoration will occur after initial tree clearing activities and will not pose a risk to the NLEB.

7.7.4.5 Long Term Operation and Maintenance

Long term operation and maintenance activities concerning the NLEB are primarily related to vegetation maintenance. The VMP describes the restrictive maintenance requirements for routine maintenance and not for emergency maintenance and/or repair actions. The objective of the VMP is to control the growth of woody vegetation capable of encroaching into the Minimum Vegetation Clearing Distance ("MVDC") of the transmission line to ensure the integrity and safe operation of the transmission line consistent with the standards of North American Electric Reliability Corporation's Transmission Vegetation Management.[31] Removing capable vegetation will be done during the initial transmission line corridor clearing, however follow-up maintenance activities during operation of the line will be required, typically on a 4-year cycle.

Since the corridor will have already been cleared of large trees during initial clearing and will be maintained in an early successional scrub shrub growth, vegetation removal during operations and maintenance will be limited and targeted to capable species or those trees that are expected to encroach into the MVDC prior to the next 4 year maintenance cycle. Typically the trees targeted for removal are young, nearing 10 feet in height, and do not meet the characteristics of suitable NLEB roosting habitat. Bats prefer larger diameter trees with known roost tree characteristics such as exfoliating bark, large crevices, cracks or cavities, typically located in forests with trees of varying age, a diverse understory and diversity of stand tree densities (Johnson, C.M. and R.A. King, eds. 2018). Although Beneficial Forest Management Practices (Johnson, C.M. and R.A. King, eds. 2018) for WNS-affected bats recommend the creation and retention of hazard trees and snags, hazard trees pose a risk to reliability and safety of the transmission line and must therefore be removed. Vegetation maintenance will not require the removal of trees considered to be suitable maternity roost habitat, therefore a time of year restriction on vegetation maintenance activities is not proposed.

[31] North American Reliability Corporation Transmission Vegetation Management, Standard FAC 003 – 3 Technical Reference, July 1, 2014.

Approximately 52.05 acres in the NECEC corridor will be managed in a tapered configuration or selectively cut in order to minimize visual or wildlife impacts. These areas include areas near Coburn Mountain, Rock Pond/Three Slide Mountain, the Upper Kennebec Deer Wintering Area winter travel corridors and the Rusty Blackbird habitat. As described in the VMP, vegetation outside of the wire zone in these areas will be managed such that capable vegetation will be maintained in a tapered configuration to the extent practicable, with heights ranging from 15 feet (from the outer edges of the wire zone toward the corridor edges for a distance of approximately 16 feet on each side), to 25 feet (from the outer edges of the 15-foot tall areas, for a distance of approximately 16 feet on each side), to 35 feet (from the outer edges of the 25 foot tall areas to the edges of the maintained right of way, for a distance of approximately 16 feet on each side). Capable vegetation will be selectively cut during periodic (typically every 2 years) routine maintenance cycles to remove individual specimens likely to either grow into the conductor safety zone prior to the next scheduled maintenance cycle, or likely to grow taller than the above target heights prior to the next scheduled maintenance cycle. Management areas of tapered vegetation may require larger tree removal during the 2-year maintenance cycle. These areas will be managed with trees of varying age and diversity of stand tree densities and may contain suitable maternity roosting trees. For these reasons, tree clearing associated with the 2-year maintenance cycle will not occur during the maternity roost season of June 1 to July 31.

7.7.4.6 Conclusion

There are no known hibernacula within ¼ mile of the proposed action and tree clearing will be avoided during the maternity roost season of June 1 to July 31. As a result, adverse effects to northern long-eared bat are not expected.

7.7.5 Bald and Golden Eagles

Potential temporary impacts to eagle nesting sites may occur during tree clearing and construction activities. The use of loud machinery in the vicinity of a nest site may cause an eagle to abandon its eggs or chicks during the nesting season. The National Bald Eagle Management Guidelines associated with the Bald and Golden Eagle Act recommends a seasonal restriction within 660 feet of a nest during the breeding season for activities that have temporary impacts (e.g. loud machinery) to avoid disturbing or taking eagles. The MDIFW recommended a seasonal restriction between March 1 and August 31, and CMP has committed to avoiding construction of the NECEC between those dates within 660 feet of known occupied nests (Site Law Application, 2017).

Bald and golden eagle and eagle nests aerial surveys were conducted along the Project corridor from the Larrabee Road Substation in Lewiston to the Canada Border at Beattie Township. on Monday, April 29,

2019 and Wednesday, May 1, 2019. Areas south of the Larrabee Road Substation are not scheduled for construction until after the 2020 eagle breeding season, and therefore were not surveyed in 2019. Details outlining the survey parameters and results are included in the 2019 Eagle and Eagle Nest Aerial Survey Letter Report in Attachment N. This letter report was also provided to the USFWS and the MDIFW on June 12, 2019.

As documented in Attachment N, there are no known occupied nests within 660 feet of the Project corridor from the Larrabee Road Substation to the Canada border. CMP will conduct annual eagle and eagle nest surveys each spring in areas scheduled for construction in any given year to determine if any new eagle nests have been established, and to determine if previously observed eagle nests are still present, near the NECEC transmission line corridors or substations.

7.8 Cultural Resources

7.8.1 Historic and Prehistoric Sites

Of the 29 sites where subsurface shovel testing was conducted, 28 are historic and one is prehistoric. Fourteen are recommended not eligible for NRHP listing. Due to MHPC concurrence, no further consideration is required for these 14 sites. One site may extend beyond the Project APE but does not contain significant deposits within the Project APE. Due to MHPC concurrence, no further consideration is required for this site within the Project APE. The remaining 14 sites are recommended for avoidance because their potential significance and NRHP eligibility cannot be determined based on the present data. For these sites, monitoring and fenced exclusion areas or additional work sufficient to make a final determination of eligibility is recommended. Monitoring while ground disturbing activities take place in the vicinity of each site and the establishment of exclusion areas will ensure that unintentional impacts do not occur. Possible unmarked graves within the Project APE that are associated with the Quinnam cemetery will also be avoided. Monitoring during ground disturbing activities is also recommended at the cemetery to ensure that unintentional impacts do not occur. Seven of the 14 sites recommended for avoidance may be potentially impacted by the Project. A finding of No Adverse Effect for these seven sites is recommended, based on the treatment plans summarized in Table 7-5.

Table 7-5. Potentially Impacted Sites Recommended for Avoidance, with Summary of Anticipated Treatment.

Site No.	Temp. ID	Summary of Treatment
ME 013-003	QMI-05-16-002/ 004	Site impacts will be limited to traversing the existing roadway. This portion of the site is extensively disturbed and would not contribute to site significance. A travel lane across the site limited to the currently disturbed roadway will be defined with temporary construction fencing.
ME 154-009	QMI-08-16-001	Site is outside Project LOD. To prevent inadvertent site impacts during construction the site area will be marked with temporary construction fencing
ME 217-001	QMI-09-01-001	Site impacts will be limited to traversing the existing roadway. This portion of the site is extensively disturbed and would not contribute to site significance. A travel lane across the site limited to the currently disturbed roadway will be defined with temporary construction fencing.
ME 217-003	QMI-08-24-001	Access across the site, if needed, will utilize the existing roadways which traverse the center of the site where disturbance was noted and where no cultural material or surface features were identified. This portion of the site is extensively disturbed and would not contribute to site significance. A travel lane across the site limited to the currently disturbed roadway will be defined with temporary construction fencing. Clearing impacts cannot be avoided. An archaeological monitor with stop work authority will be onsite while clearing is conducted and the construction team will implement hand-cutting or reach-in techniques for vegetation removal. Following vegetation removal the site area will be marked with temporary construction fencing
ME 293-016	QMI-03-01-002	Access across the site, if needed, will utilize the existing roadways which traverse the center of the site where disturbance was noted and where no cultural material or surface features were identified. This portion of the site is extensively disturbed and would not contribute to site significance. A travel lane across the site limited to the currently disturbed roadway will be defined with temporary construction fencing. Clearing impacts cannot be avoided. An archaeological monitor with stop work authority will be onsite while clearing is conducted and timber mats placed in consultation with the archaeological monitor will prevent subsurface disturbance and will avoid sensitive archaeological features or areas with surficial deposits.
ME 478-006	S11-05-03-003	Site impacts will be limited to traversing the existing roadway. This portion of the site is extensively disturbed and would not contribute to site significance. A travel lane across the site limited to the currently disturbed roadway will be defined with temporary construction fencing. Structures 3027-28 and 392-197 are in close proximity to the site. Subsurface testing will verify that planned pole and anchor locations do not contain significant deposits prior to structure installation. An archaeological monitor with stop work authority will be present during construction activities.
ME 484-006	S11-05-01-001	One structure is within an interior portion of the site that is in a disturbed context adjacent to existing roadways, devoid of both cultural material and surficial cultural features, and does not contribute to significance. Travel and work area swill be defined with temporary construction fencing and will be limited to currently disturbed portions of the ROW. Archaeologists will verify through subsurface testing that planned pole and anchor locations do not contain significant deposits prior to structure installation. An archaeological monitor with stop work authority will be present during construction activities. Potentially significant portions of the site will be marked with temporary construction fencing to prevent inadvertent site impacts.

7.8.2 Historic Architecture

SEARCH submitted a mitigation plan to MHPC in May 2019 that included summaries of the potential adverse effects at the four NRHP-eligible resources and recommended alternatives for mitigating adverse effects on three of those resources. The four resources are a Barn at 40 Turmel Road, the mid-twentieth century Bowman Airfield, the Appalachian National Scenic Trail (ANST), and Hilton Road Historic District (1195 and 1294 Hilton Hill Road). The agricultural building and airfield will incur visual effects from the Project, while the Appalachian Trail and rural agricultural historic district will incur both visual and physical effects from the project.

Adverse visual effects to the Barn at 40 Turmel Road and Bowman Airfield cannot be avoided because the Project consists of overhead transmission with required structure heights and spans that are larger than the existing infrastructure. Similarly, because the Project crosses parcels that form the Hilton Road Historic District, neither physical nor visual impacts can be entirely avoided. The ANST currently crosses the project in three locations. Due to the east-west direction of the ANST and north south orientation of the Project, direct physical and indirect visual impacts to the ANST cannot be avoided.

MHPC has recommended mitigation composed of additional reconnaissance survey in the townships of Livermore Falls and Starks within previously undocumented areas. CMP has indicated its willingness to fund this mitigation consistent with the level of effort required to complete a Historic American Building Survey (HABS) or NRHP level documentation.

The scope of the Project's impacts to the ANST will be minimized prior to construction. CMP has engaged with the ATC and the MATC on proposals to alter the ANST's route in the vicinity of the Project such that it crosses once versus the current three times. In addition, CMP is exploring options to limit clearing at the crossing location in order to minimize visual impacts. However, because the Project cannot avoid the ANST this resource will be adversely affected.

Mitigation of adverse effects to the Appalachian Trail will be determined through the Section 106 process led by the USACE, and in consultation with MHPC, the National Park Service as the federal landowner, and other consulting parties. The ATC and MATC have proposed that impacts to the ANST be mitigated by funding to secure property rights to create a single crossing at a location they have identified.

7.8.3 Conclusion

Through implementation of the cultural resource surveys described above, and consultation with state, federal, and tribal agencies, the NECEC Project has identified its potential to impact historic properties eligible for listing in the NRHP. The USACE and relevant consulting parties will become signatories to a

MOA that will govern the implementation of treatment plans that will avoid, minimize, or mitigate these effects and complete the Section 106 consultation process.

7.9 Land Use and Recreation

Land use impacts are expected to be minimal as the land uses near the Project generally are compatible with the siting, construction, and operation of transmission lines.

The existing transmission line corridor between The Forks Plantation and Larrabee Road Substation, traverses or is bordered by agricultural lands, forests, commercial areas, residential neighborhoods, recreational areas, areas of scenic and historic significance, and a wide variety of wildlife habitat. In many cases, the existing corridor pre-dates nearby land uses, and by being sited within or adjacent to the existing corridor, the Project will maintain existing land use patterns along the existing corridor.

A majority (approximately 73%) of the NECEC Project will be constructed within existing transmission corridors. Using an already developed corridor minimizes impacts to existing land uses as well as the environment and is a sound land use and environmental siting principle. The approximately 53.5 miles of new corridor between Beattie Township and an existing transmission line corridor in The Forks Plantation traverses sparsely populated land, which is primarily forested and managed for timber production and regularly harvested, and recreational uses (e.g., hunting, fishing, hiking, recreational vehicle use, etc.). These uses will also continue uninterrupted during and after construction.

Anticipated temporary construction activities include construction and vehicle traffic, traffic diversion, clearing of all capable woody vegetation, grading of laydown areas for equipment, excavation, temporary matted wetland and stream crossings, and other associated construction activities. The long-term operation of the NECEC will not interfere with existing or future land use patterns.

7.10 Air Quality

No degradation of air quality is expected to result from construction and operation of the NECEC Project. Minimal, temporary influences on air quality as a result of Project construction activities may occur. Such influences may arise from construction personnel commuter traffic, exhaust from construction vehicles, and temporary dust generated by construction activities which expose soil and which require vehicular travel along unpaved roads. Given the limited duration of activities at any one location, the generally rural nature of the NECEC Project area and the existing uses of unpaved roads along the transmission line corridors (e.g., logging and associated trucking), any influences on overall air quality will be insignificant. Emissions of fugitive dust will depend on such factors as soil properties (e.g., moisture content, volume of spoils, and soil fines content), meteorological conditions, and construction practices

employed. Fugitive dust is only expected at substation construction sites and along unpaved construction access roads. Best management construction practices will be employed to minimize emissions of fugitive dust, including:

1. Use of water or other wetting agents on areas of exposed and dry soils;
2. Use of covered trucks for transport of soils or other dry granular materials;
3. Controlled storage of spoils on the construction site which may include mulching storage piles with hay or covering with tarps in concert with containing the piles with erosion control mix and/or silt fencing; and
4. Final grading, landscaping, and revegetation or permanent stabilization with approved materials as soon as practical.

7.11 Noise

Noise is subjective and can affect individuals within audible range. For this reason, the MDEP has developed a standard that establishes methods for determining ambient sound levels and defines acceptable operational sound levels. The NECEC Project involves installation, upgrade and/or expansion of numerous transmission lines and substations throughout Maine, as discussed within this section. Both transmission lines and substations can produce sound.

Noise falls under MDEP jurisdiction and has been fully assessed and modeled in the Site Law Application and supplemental materials.[32] This Application documents that CMP has made adequate provision for the control of excessive environmental noise from the proposed Project.

[32] Site Law Application, Section 5.0, September 29, 2017; Response to MDEP Information Request, submitted 7/23/2018; Raven Farm Sound Study submitted 7/10/2018; HDD Application Amendments submitted 10/19/2019.

8.0 ALTERNATIVES ANALYSIS

8.1 Introduction

Under 40 C.F.R. § 230.10(a) (the 404(b)(1) Guidelines), pursuant to Section 404 of the CWA, a permit applicant must document that a proposed project will avoid and minimize impacts to protected natural resources to the maximum extent practicable. A project will not be permitted if there are practicable alternatives that would meet the Project purpose and have less environmental impact. Pursuant to the 404(b)(1) Guidelines, "[a]n alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes" (40 C.F.R. § 230.10(a)(2)). Pursuant to § 230.10 of the Guidelines, the USACE may not issue a permit for the discharge of dredged or fill material if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant environmental consequences. Specifically, § 230.10(a)(3) states: *where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not ''water dependent''), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.* CMP's updated alternatives analysis demonstrates that it has overcome this presumption of practicable alternatives, and that the Project will not cause significant degradation of the waters of the United States (as described in Section 7.0).

CMP prepared the following updated alternatives analysis for the Project for review by the USACE. The discussion included in this section of the application package describes the process by which alternatives were developed and evaluated to identify a technically and economically sound solution that avoids and minimizes adverse impacts on the aquatic ecosystem and protected natural resources, to achieve the least environmentally damaging practicable alternative ("LEDPA"). As discussed below, after consideration of ownership, landscape, location, design constraints on the transmission system, cost and potential impacts to the aquatic ecosystem, CMP has demonstrated and overcome the presumption that there are any other existing routes or design alternatives not involving special aquatic sites, that meets the purpose and need for the project while representing the LEDPA.

8.2 NECEC Purpose and Need

The purpose of the NECEC Project is for CMP to deliver up to 1,200 MW of Clean Energy Generation from Québec to the New England Control Area[33] via an HVDC transmission line, at the lowest cost to ratepayers. The Project is routed on private land that CMP already owns or controls, including existing transmission corridors. The route is shorter than other routes from Québec to New England and represents the lowest-cost path for delivery of Clean Energy Generation[34] from Québec.

The NECEC Project responds to Massachusetts' RFP seeking 9,450,000 MWh of Clean Energy Generation to be procured through cost-effective long-term contracts. The Project's selection under the RFP demonstrates that Massachusetts has concluded that the NECEC will meet this need. Furthermore, the clean energy delivered by the Project will provide firm, guaranteed, and tracked year-round energy deliveries that will reduce winter electricity price spikes, improve system reliability and resiliency, and provide renewable energy certificates and other environmental attributes to help Massachusetts meet its GHG emission reduction goals.

CMP will not seek any cost recovery from Maine ratepayers for the Project. Rather the Project will be paid for entirely HRE, which is an affiliate of Hydro-Québec, and Massachusetts ratepayers in accordance with FERC-approved TSAs.

Further, after considering all the evidence submitted in the MPUC proceeding over the course of a nineteen-month adjudicatory proceeding, the MPUC issued a 100-page order on May 3, 2019 granting a CPCN for the NECEC.[35] In its Order, the MPUC concluded that the NECEC "will result in significant incremental hydroelectric generation from existing and new resources in Québec and, therefore, will result in reductions in overall GHG emissions through corresponding reductions of fossil fuel generation

[33] The New England Control Area includes the transmission system administered by ISO-New England, the regional transmission organization (RTO), located in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, but does not include the transmission system in northern Maine (i.e., Aroostook County and parts of Penobscot and Washington counties).

[34] Under the terms of the RFP, "Clean Energy Generation" means either: (1) firm service hydroelectric generation from hydroelectric generation alone; (ii) new Massachusetts Class I RPS eligible resources that are firmed up with firm service hydroelectric generation; or (iii) new Massachusetts Class I RPS eligible resources.

35 In the Order, the MPUC found that the CPCN statute requires the MPUC to make specific findings with regard to the public need for the proposed transmission line, taking into account, among other factors, state renewable energy generation goals. MPUC Order at 17. The MPUC also found that Title 38, Chapter 3-A, the climate change statute that establishes GHG reduction targets for the State of Maine, and Chapter 3-B, which authorizes Maine's participation in the Regional Greenhouse Gas Initiative (RGGI), fall within the MPUC's consideration of state renewable energy goals because, when taken together, those statutes address various renewable energy-related goals, including supply diversity and reliability, and GHG emission reductions. MPUC Order at 23.

(primarily natural gas) in the region."[36] The MPUC further concluded that because it found that the NECEC will result in incremental hydroelectric generation, it follows that the Project will also provide GHG emissions reduction benefits in the region in the range of approximately 3.0 to 3.6 million metric tons per year.[37]

8.3 NECEC Alternatives

The alternative routes considered in this analysis focus on the HVDC line component, from the Canadian border to the interconnection point with the grid at Larrabee Road Substation (Segments 1, 2 and 3), and associated substation upgrades, with all other components (i.e., Section 62/64 115kV rebuilds (Segment 4) and the new Section 3027 345kV line (Segment 5)) assumed to remain as proposed in all three scenarios. These latter line sections are being proposed in existing CMP corridors and, as such, the alternatives to these line sections would be to site these sections in new corridors, which would not meet the intended LEDPA objective. Thus, route alternatives for these Project components are not discussed in detail in this narrative. The proposed Project route, also known as the Preferred Alternative, is evaluated and compared to the no-action alternative (Section 8.3.1), two overhead route alternatives (Section 8.3.2.1), underground alternatives (Section 8.3.2.2.), alternatives considering co-location with existing transportation routes (Section 8.3.2.3) and electric distribution corridors (Section 8.3.2.4). Additionally, border crossing alternatives (Section 8.3.2.5), Outstanding River Segment crossing alternatives (Section 8.3.2.6), LUPC P-RR Subdistricts route alternatives (Section 8.3.2.7) and alternative sites for substations (Section 8.3.3) were considered.

8.3.1 No-Action Alternative

Not constructing the NECEC Project is the no-action alternative. The no-action alternative, however, would not meet the NECEC Project's purpose of allowing CMP to deliver 1,200 MW of clean energy generation from Québec to the New England Control Area at the lowest cost to ratepayers. In addition, even if a non-CMP project could be permitted elsewhere and could economically deliver 1,200 MW of clean energy generation from Québec to the New England Control Area, such a project would not meet CMP's need to deliver that energy, and such a project would have unknown environmental impacts.

Further, the no-action alternative, if no alternative projects are built, would not reduce GHG emissions, would not reduce the wholesale cost of electricity for the benefit of retail customers across the region, and

[36] CPCN Order at 71.
[37] CPCN Order at 72.

would not enhance electric reliability, particularly in winter months when natural gas supply and transfer constraints have occurred in recent years.

Thus, the no action alternative would not meet the Project purpose and need.

8.3.2 HVDC Transmission Alternatives

The consideration of alternatives for the HVDC transmission line component of the Project discussed below includes:

- overhead transmission route alternatives,
- underground transmission alternatives,
- transportation route alternatives,
- an electric distribution route alternative,
- border crossing alternatives; and
- outstanding river segment alternatives.

8.3.2.1 Overhead HVDC Transmission Route Alternatives

The three overhead HVDC transmission line route alternatives, which have been considered as part of this analysis, would all meet the purpose and need to deliver clean energy generation from Québec to the New England Control Area. However, as discussed below, the two potential alternatives to the chosen route would result in more environmental impact than the proposed route for the NECEC corridor and neither is the LEDPA.

Criteria for Assessment of Overhead Transmission Route Alternatives

The HVDC transmission line route alternatives were first identified through a geospatial desktop analysis, utilizing publicly available Geographic Information System ("GIS") data. Alternatives were then evaluated and compared based on several parameters (points of comparison). CMP quantified and evaluated the following comparison criteria, listed in order of generally decreasing priority with respect to transmission line route selection:

- Conserved Lands
- Undeveloped Right of Way
- Clearing
- Stream Crossings
- Transmission Line Length
- National Wetlands Inventory (NWI) Mapped Wetlands

- Deer Wintering Areas
- Inland Waterfowl and Wading Bird Habitat
- Public Water Supplies
- Significant Sand and Gravel Aquifers
- Parcel Count Total

Each of these parameters is described in more detail below.

Conserved Lands

CMP's analysis identified the number of distinct parcels in federal, state, municipal, or non-profit ownership that would be crossed, some of which may be subject to conservation-related land use restrictions, and the acreage of conserved lands that would be directly impacted (i.e., acreage cleared or otherwise altered) by the NECEC. Conserved lands include (i) parcels whose rights are partially or entirely owned or controlled by the NPS (i.e., the Appalachian Trail ("AT"), for which CMP granted NPS an easement) or the Maine Bureau of Parks and Lands and (ii) lands subject to conservation easements that restrict development or other alteration of the land. These lands are often of high ecological, recreational, and/or aesthetic value. To preserve these values, CMP considered and favored transmission line routes that minimized crossings of conserved lands.

Undeveloped Right of Way

CMP's analysis identified the total length, in miles, of previously undeveloped transmission line corridor that would need to be developed. To minimize wildlife habitat conversion, loss, or fragmentation, the analysis favored transmission line routes that minimized previously undeveloped land requiring development as a transmission line corridor.

Clearing

CMP's analysis identified the acreage of tree clearing required within the transmission line corridor and favored transmission line routes that minimized tree clearing, to minimize habitat conversion-related impacts.

Stream Crossings

CMP's analysis identified the number of mapped features listed in the USGS - National Hydrography Dataset ("USGS NHD") that would be crossed by the transmission line. CMP favored transmission line routes that minimized stream crossings, to minimize unavoidable temporary (e.g., construction mat crossings) and permanent (e.g., increased insolation) impacts to those aquatic ecosystems.

Transmission Line Length

CMP's analysis identified the total length, in miles, of new transmission line required and CMP favored transmission line routes that minimized total transmission line length in order to reduce overall environmental impacts.

NWI Mapped Wetlands

CMP's analysis identified wetlands and water bodies (generally one acre and larger), listed in the National Wetlands Inventory ("NWI") maps developed by the USFWS, which would be crossed by the transmission line. CMP favored transmission line routes that minimized crossings of wetlands and water bodies, to minimize unavoidable temporary (construction mat crossings) and permanent (habitat conversion, filling) impacts to those aquatic ecosystems.

Deer Wintering Areas

CMP's analysis identified the number of DWAs listed by the Maine Office of GIS that would be crossed by the transmission line, and the acreage of DWA directly impacted (i.e., acreage cleared or otherwise altered). CMP favored transmission line routes that minimized intersections with DWAs, to minimize the need for clearing of woody vegetation within DWAs as a result of construction and maintenance activities.

Inland Waterfowl and Wading Bird Habitat

CMP's analysis identified the number of distinct waterfowl and wading bird habitats, and the total acreage listed by the Maine Office of GIS, crossed by the transmission line. Inland waterfowl and wading bird habitats include breeding, feeding, roosting, loafing, and migration stopover areas. Waterfowl habitats are divided behaviorally and seasonally into three categories: breeding habitats, migration and staging habitats, and wintering habitats (Maine Department of Inland Fisheries & Wildlife 2005b). CMP favored transmission line routes that minimized intersections with IWWHs, to avoid and minimize clearing of vegetation within IWWHs required for transmission line construction and maintenance.

Public Water Supplies

CMP's analysis identified the number of public water supplies listed by the Maine Office of GIS and within 500 feet of the transmission line corridor. CMP favored transmission line routes that minimized crossing of public water supplies, to minimize the potential for any construction-related impacts to those resources.

Significant Sand and Gravel Aquifers

CMP's analysis identified the number of significant sand and gravel aquifers identified by the Maine Office of GIS that would be crossed by the transmission line. CMP favored transmission line routes that minimized crossing of significant sand and gravel aquifers, which are, or may be, used as private or public water supplies, to minimize the potential for any construction-related impacts to those resources.

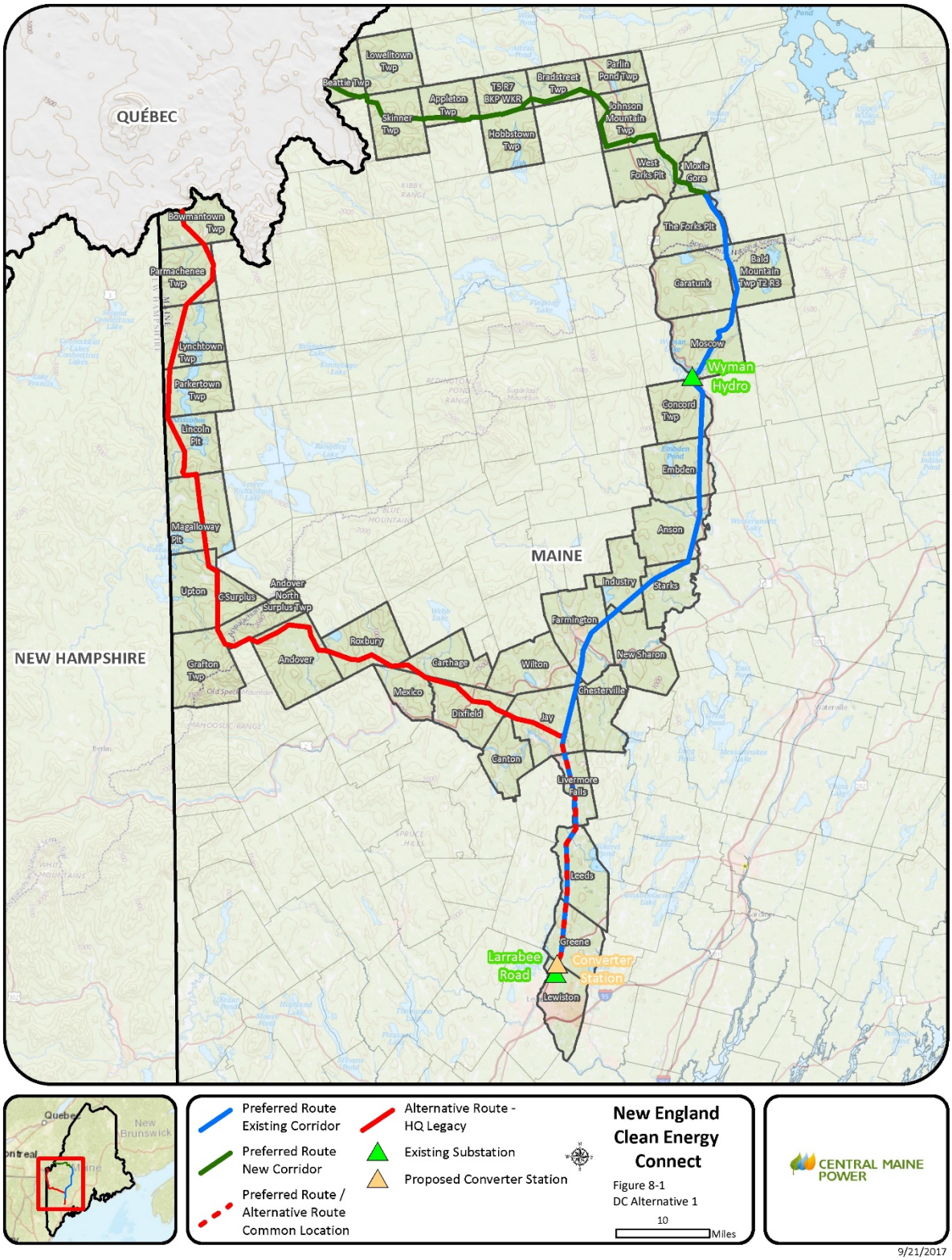
Parcel Count Total

CMP's analysis identified the number of land parcels for which CMP would require the acquisition of title, right, or interest. CMP considered and favored transmission line routes with the highest likelihood of successful land rights acquisition and utilized the number of parcels for which it would need title, right, or interest as one indicator of this.

HVDC Alternative 1- 1980's Québec Corridor

HVDC Alternative 1 (Alternative 1) is based on CMP's attempt in the late 1980s to acquire and permit a transmission line project from Québec to the Lewiston, Maine area. At that time, CMP had acquired title, right, or interest, primarily through real estate option agreements, on a significant portion of that corridor. However, the MPUC did not approve that project and the real estate option agreements have since expired. The Alternative 1 corridor would extend from the Canadian border in western Maine approximately 119.3 miles to an interconnection point in Lewiston, Maine (see Figure 8-1). Alternative 1 would be located primarily in a new corridor and partially in undeveloped width in existing corridors.

Figure 8-1: HVDC Alternative 1



Alternative 1 begins in Bowmantown Township, Oxford County, Maine at a point on the Maine/Québec border about 0.75 mile east of the Maine/New Hampshire border. The corridor extends south through Bowmantown Township, Parmachenee Township, Lynchtown Township, Parkertown Township, and Lincoln Plantation, all in Oxford County. The corridor is west of Parmachenee Lake and Aziscohos Lake. In Lincoln Plantation, the corridor crosses Route 16 approximately 0.75 mile west of the bridge across the Magalloway River and then crosses the Magalloway River. At the south line of Lincoln Plantation, the corridor turns east for about 1.25 miles and then south across Magalloway Plantation, Oxford County, following the west property boundary of an industrial forest landowner to the south line of Magalloway Plantation. The entire eight miles across Magalloway Plantation is now subject to a conservation easement held by the New England Forestry Foundation, so a realignment to cross other properties would be necessary in this area.

From Magalloway Plantation the corridor continues south across the Town of Upton, Oxford County, crossing the Rapid River about 0.5 mile south of the outlet of Pond-in-the-River. In the 1980s the land along the Rapid River was owned by an affiliate of CMP. That land and additional land on each side of the river is now controlled by the Rangeley Lakes Heritage Trust and the MDIFW and is subject to a conservation easement. Obtaining rights for a transmission line through this conservation easement is highly unlikely.

South of the Rapid River the corridor runs southeast to C Surplus Township, Oxford County, and then turns south following the west line of C Surplus Township to the southern boundary of the township. C Surplus Township is now subject to a conservation easement held by the New England Forestry Foundation; therefore, the alignment would need to be moved to the east boundary of Upton Township. From C Surplus, the route follows the western line of Andover North Surplus or the eastern line of Grafton Township, both in Oxford County, for about two miles before turning east to the southern boundary of Andover North Surplus and the western boundary of the Appalachian Trail corridor. No records could be located to determine how CMP planned to cross the Appalachian Trail corridor for the circa 1985 project.

From the eastern boundary line of the Appalachian Trail corridor the Alternative 1 corridor follows the southern boundary line of Andover North Surplus for about one mile before turning east and crossing into the Town of Andover, Oxford County, where the corridor roughly follows the north and then east town lines before crossing into the Town of Roxbury, Oxford County. The corridor crosses Route 120, the Swift River, and Route 17 in the southeast part of the town and then exits Oxford County, entering Franklin County for about three miles in the Town of Carthage before reentering Oxford County on the

northern boundary of the Town of Mexico. In less than 0.75 mile, the Alternative 1 corridor then crosses the Webb River and into the Town of Dixfield, Oxford County, where the corridor continues southeast across Dixfield, crossing U.S. Route 2 before crossing the eastern boundary line of the Town into the Town of Jay, Franklin County. Continuing southeasterly across the Town of Jay and the very northern tip of the Town of Canton, Oxford County, the corridor crosses Route 4 and then Route 133 before connecting with the Section 278 corridor about 2.25 miles north of the Livermore Falls Substation. From the point of intersection with Section 278 south to Larrabee Road Substation, a distance of approximately 26 miles, Alternative 1 is the same as the Preferred Alternative.

HVDC Alternative 1 Comparison

Table 8-1**,** below, compares the NECEC Preferred Alternative to Alternative 1.

Table 8-1: Comparison of NECEC Preferred Alternative to Alternative 1

Point of Comparison	Unit	Preferred Alternative	Alternative 1
Conserved lands	no./acres	6 parcels/42 acres	8 parcels/275.3 acres
Undeveloped ROW	miles	53.5	93.1
Clearing	acres	1,823	1,934
Stream crossings	no.	115	88
Transmission line length	miles	146.5	119.3
NWI mapped wetlands	no./acres	263 wetlands/76.3 acres	238 wetlands/118.3 acres
Deer wintering areas	no./acres	8 DWAs/44.3 acres	8 DWAs/71.3 acres
Inland waterfowl and wading bird habitat	no./acres	12 IWWH/22.7 acres	9 IWWH/23.1 acres
Public water supplies within 500 feet	no.	1	1
Significant sand and gravel aquifers	no.	12	7
Parcel count total	no.	7	120

Conserved Lands

The Preferred Alternative crosses fewer conserved land parcels, significantly less conserved land acreage, and has fewer miles of new corridor than Alternative 1. As a result, the Preferred Alternative would cause less potential habitat conversion than Alternative 1.

A crossing of the Appalachian Trail would be required for both routes. An overhead crossing of the Appalachian Trail for Alternative 1 would require the acquisition of an easement and a 150-foot wide swath of tree clearing across the trail where no transmission line currently exists. In comparison, the Preferred Alternative crosses the Appalachian Trail in an existing transmission line corridor and is next to an existing gravel road. CMP owns the Appalachian Trail on Section 222. CMP acquired the rights in fee circa 1950. It later conveyed an easement to the NPS and retained the fee ownership and specifically the right to construct overhead electric transmission and communication lines for the entire 300-foot wide corridor. CMP would require only an additional 75 feet of tree clearing for the installation of the overhead transmission line for the Preferred Alternative.

Undeveloped Right of Way

Alternative 1 would require 93.1 miles of new corridor, compared to 53.5 miles of new corridor for the Preferred Alternative, an increase in 39.6 miles of currently undeveloped ROW.

Clearing

Although Alternative 1 is shorter in overall length than the Preferred Alternative, Alternative 1 would require an additional 111 acres of tree clearing compared to the Preferred Alternative.

Stream Crossings

The USGS NHD identified more stream crossings along the Preferred Alternative than Alternative 1, likely a function of transmission line corridor length. CMP's standard construction practice is to install temporary equipment spans over streams and to avoid all in-stream activities. Consequently, the primary potential impacts to stream habitat are sedimentation and insolation. CMP mitigates the potential for those impacts by installing erosion and sedimentation controls, by routine cleaning of temporary crossing (construction mats) spans, and by maintaining riparian buffers during operations and maintenance of the line. When considering all other criteria evaluated as well as the minimization and mitigation measures incorporated into CMP's Applications, the Preferred Alternative remains the LEDPA even with a slightly higher number of stream crossings identified.

Transmission Line Length

The Alternative 1 transmission line corridor is 119.3 miles in length; about 27.2 miles shorter than the Preferred Alternative. Alternative 1, however, would require 93.1 miles of new corridor, an increase in 39.6 miles of new corridor in comparison to the Preferred Alternative.

NWI Mapped Wetlands

A comparison of mapped NWI wetlands along Alternative 1 and the Preferred Alternative identified 25 more wetlands along the Preferred Alternative. However, construction in the Alternative 1 corridor would result in an additional 42 acres of wetland impact when compared to the Preferred Alternative. The primary impact to wetlands from construction of the Project will be the conversion of forested wetland to early successional scrub-shrub and meadow cover types. As a result, other than a minor amount of permanent fill associated with structures placed in wetlands where no siting alternatives are available, the permanent loss of wetlands from construction of the Project on either route is negligible.

Deer Wintering Areas

The Preferred Alternative would cross eight DWAs and would require the conversion of 44.3 acres of DWA habitat. In comparison, Alternative 1 would also cross eight DWAs, but would require the conversion of 27 more acres of DWA habitat than the Preferred Alternative.

Inland Waterfowl and Wading Bird Habitat

The Preferred Alternative would cross 12 IWWHs and require the conversion of 22.7 acres of IWWH habitat, while Alternative 1 would cross nine IWWHs and would require the conversion of 23.1 acres of IWWH.

Public Water Supplies within 500 Feet

One public water supply is located within 500 feet of both the Preferred Alternative and Alternative 1.

Significant Sand and Gravel Aquifers

Impacts from the construction and operation of a transmission line are unlikely to impact aquifers due to the short duration of equipment operation and the implementation of environmental controls, and spill reporting and cleanup procedures utilized by CMP and its contractors during construction.

Parcel Count Total

The Alternative 1 corridor would require CMP to acquire title, right, or interest in 120 parcels of land. In contrast, the Preferred Alternative requires the acquisition of rights in only seven parcels. CMP has acquired rights for all seven parcels.

Preferred Alternative vs. Alternative 1 Summary

A comparison of the environmental resources traversed by both routes documents that Alternative 1 traverses more environmental resources than the Preferred Alternative relative to overall transmission line length. Additionally, when assessing the extent of impact, the conversion of habitat is much greater along the Alternative 1 route than the Preferred Alternative.

Alternative 1 transmission structures would be visible from Black Mountain Ski Area in the Town of Rumford, Maine, Rapid River in Upton, and Aziscohos Mountain in Lincoln Plantation as well as from the Appalachian Trail. The Preferred Alternative is comparatively advantageous in that it would cross the Appalachian Trail in a location with an existing overhead transmission line corridor.

Alternative 1 would require the acquisition of 120 parcels of private land in addition to rights needed to cross conservation lands. Additionally, 93.1 miles of Alternative 1 consists of a new corridor with no land rights under agreement, controlled, or owned by CMP.

For these reasons, Alternative 1 is more environmentally damaging to the aquatic ecosystem than the Preferred Alternative, and it is not the LEDPA.

HVDC Alternative 2- Bigelow Corridor

HVDC Alternative 2 (Alternative 2) would extend from the Canadian border in western Maine approximately 138.5 miles to an interconnection point in Lewiston, Maine (see Figure 8-2). The line would be located partially in a new corridor and partially in undeveloped width in existing corridors.

The Alternative 2 corridor begins in western Maine in Beattie Township, Franklin County, Maine at a point on the Canadian border approximately 2.5 miles north of the southwest corner of the township. The alternative corridor extends southeast along the Preferred Alternative for approximately 7.75 miles across Beattie Township, the southwest corner of Lowelltown Township and southerly across Skinner Township to a point where the Preferred Alternative turns east. The Preferred Alternative corridor has been acquired; therefore, no additional acquisition would be necessary in the first 7.75 miles of Alternative 2. Both routes require the acquisition by lease of the Lowelltown parcel from the Passamaquoddy Tribe.

Alternative 2 continues southerly approximately 8.75 miles to a point in Kibby Township, Franklin County, where the corridor begins to parallel the Kibby Mountain Wind Farm 115kV generation lead line. Elevations range from 1,900 feet near the intersection with the generator lead to just under 2,700 feet. The Alternative 2 corridor parallels the generator lead south across Kibby Township, Jim Pond Township, the Town of Eustis, and Coplin Plantation, all in Franklin County. The 115kV generator lead from the

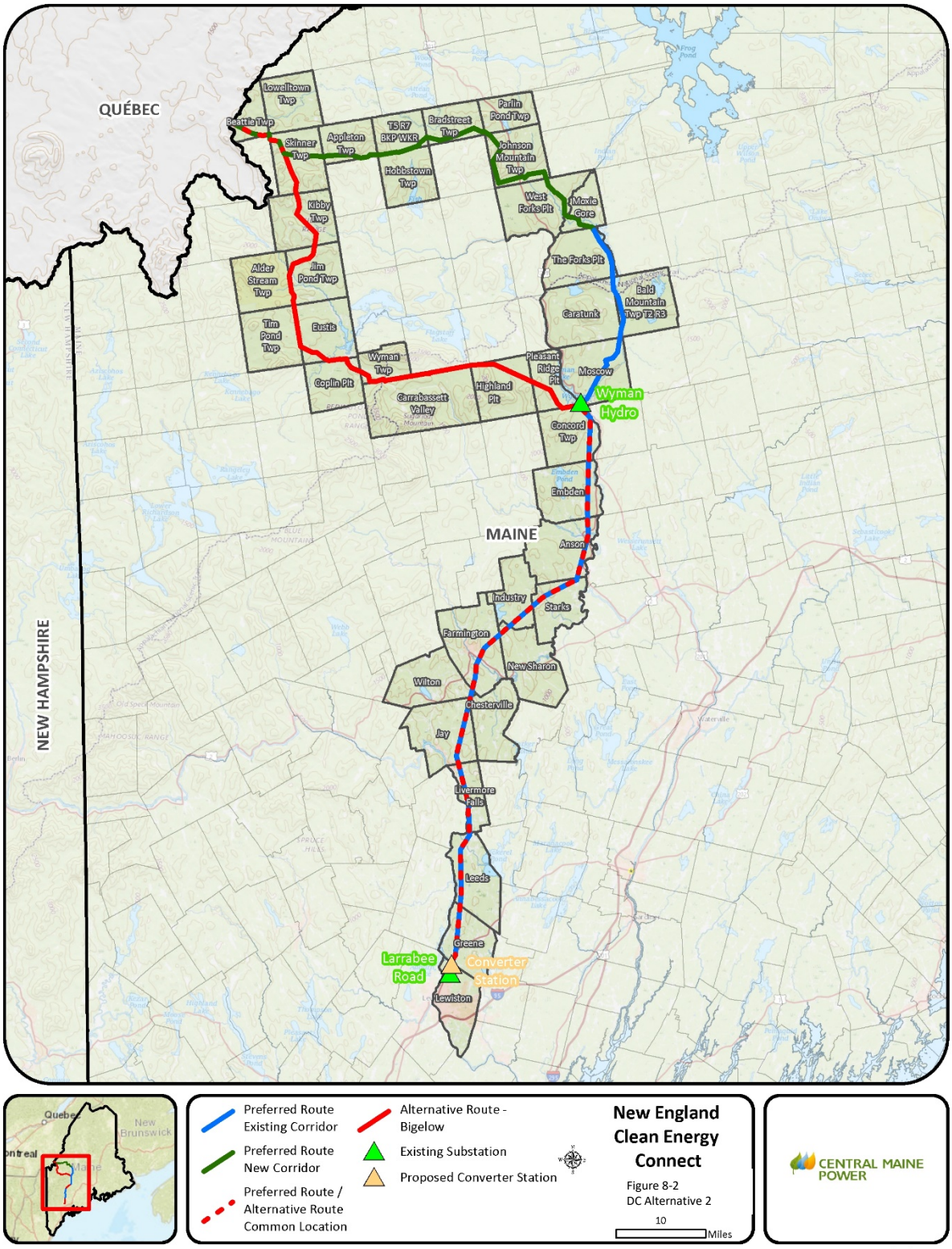
Stratton Energy biomass plant begins to parallel the Kibby generator lead in Coplin Plantation and both lines continue to parallel the Alternative 2 corridor southeast across Coplin Plantation and Wyman Township to the Bigelow Substation located on the east side of Route 27 along the northern line of the Town of Carrabassett Valley.

Alternative 2 parallels the generator lead for a total distance of approximately 27.5 miles. Elevation ranges from about 1,250 feet to about 1,900 feet on this portion of the alternative. The Alternative 2 corridor from the Preferred Alternative to Bigelow Substation would require the acquisition of a 150-foot wide corridor. This section of new corridor would be located parallel to, but would not overlap, the existing generator lead corridor. It is not possible to co-locate the Alternative 2 corridor and the Kibby generator lead corridor because there is insufficient available space within this corridor to host two transmission lines. Thus, development of Alternative 2 would result in a new full width corridor adjacent to the existing corridor in this location.

The surrounding land generally is industrial forest land typified by spruce-fir and northern hardwood forest types that are owned and managed for timber production. Most of the area is undeveloped, with only a few seasonal dwellings. Recreation is typically permitted on the industrial forest lands. The Village of Stratton is located about 0.25 mile east of the alternative corridor, but the corridor does not impact any residential areas. There is one industrial wind farm located in Kibby Township, and both a biomass generation plant and a sawmill are located in Stratton.

The Alternative 2 corridor crosses Route 27 twice and Route 16 once. Access routes would need to be acquired over private roads. The alternative corridor crosses the Appalachian Trail on the north side of the Wyman/Carrabassett Valley town line. Overhead rights were obtained from the U.S. Department of the Interior (DOI) for the Stratton Energy generator lead circa 1985. However, DOI refused to grant rights to cross the AT, either overhead or underground, for the Kibby Wind generator lead circa 2010 and the generator lead was placed underground in the Route 27 highway right of way. Obtaining a Special Use permit from the NPS to cross the Appalachian Trail corridor with an overhead line is highly unlikely. The cost and complexity of an underground crossing, whether buried roadside in the Route 27 right of way or placed underneath the Appalachian Trail corridor via directional bore, would pose a financial barrier and an engineering challenge.

Figure 8-2: HVDC Alternative 2



Starting at the Bigelow Substation, the Alternative 2 corridor would be co-located for approximately 23.5 miles with CMP's Section 215 corridor, which crosses the Town of Carrabassett Valley and Highland Plantation and Pleasant Ridge plantation, all in Somerset County. Elevation ranges from about 1,100 feet to about 1,900 feet for this portion of the alternative.

Section 215 is a 115kV radial line[38] built on H-frame structures in a 150-foot wide corridor. For approximately 9.5 miles, the Section 215 corridor is located along the northern boundary line of Carrabassett Valley, which is also the southern line of the Bigelow Preserve, a large Maine-owned tract with strict land use restrictions designed to limit development. A one mile-long portion of the Bigelow Preserve extends across the Section 215 corridor. Section 215 originates at Wyman Hydro and terminates at Bigelow substation.

Most of the eastern half of Carrabassett Valley is owned by the Penobscot Indian Nation. Most of the land in Highland Plantation and Pleasant Ridge Plantation is industrial forest land, although there are smaller tracts of private forest ownership and some residential development along Rowe Pond Road in Pleasant Ridge, which is crossed twice by Section 215. The acquisition of an additional 75 feet of width would be necessary to co-locate with the Section 215 corridor. However, acquiring additional width through the Bigelow Preserve would be impossible due to significant land use restrictions in the Preserve. Therefore, Alternative 2 would require that the DC line be double-circuited with Section 215, placed underground, or rerouted southerly around the Bigelow Preserve ownership.

Given the probable need to cross the Appalachian Trail underground, the difficulty in taking radial line Section 215 out of service (i.e., there is no other CMP 115 kV line connected to the Bigelow substation so the loss of Section 215 could jeopardize the entire load and generation serviced by this substation), and the expected visual impacts of Alternative 2, the Alternative 2 line would need to be installed underground from the north side of the Appalachian Trail corridor to the Highland Plantation town line, a distance of approximately 10 miles. Because underground transmission line construction costs can be approximately 4-10 times that of overhead construction, this represents a significant financial barrier. Conversely, the Preferred Alternative would cross the Appalachian Trail in an existing corridor owned by CMP.

[38] A radial transmission line is a transmission line that is supplied from one direction only and terminates without connecting with another transmission line.

A new corridor approximately 0.75-mile-long will be necessary to connect the Section 215 corridor in southeastern Pleasant Ridge Plantation and the Section 63 corridor in northeastern Concord Township. This segment of the Alternative 2 corridor would need to be 150 feet wide.

From the point of intersection with the Section 63 corridor, which is approximately 0.75 mile south of the Wyman Dam, Alternative 2 would follow the Preferred Alternative to Larrabee Road Substation in Lewiston.

Alternative 2 Comparison

Table 8-2, below, compares the NECEC Preferred Alternative to Alternative 2.

Table 8-2: Comparison of NECEC Preferred Alternative to Alternative 2

Point of Comparison	Unit	Preferred Alternative	Alternative 2
Conserved lands	no./acres	6 parcels/42 acres	9 parcels/53.2 acres
Undeveloped ROW	miles	53.5	17.3
Clearing	acres	1,823	1,670
Stream crossings	no.	115	123
Transmission line length	miles	146.5	138.5
NWI mapped wetlands	no./acres	263 wetlands/ 76.3 acres	283 wetlands/ 113.3 acres
Deer wintering areas	no./acres	8 DWAs/44.3 acres	8 DWAs/44 acres
Inland waterfowl and wading bird habitat	no./acres	12 IWWH/22.7 acres	12 IWWH/16.5 acres
Public water supplies within 500 feet	no.	1	1
Significant sand and gravel aquifers	no.	12	10
Parcel count total	no.	7	34

Conserved Lands

The Preferred Alternative and Alternative 2 both cross conserved land parcels. However, Alternative 2 would traverse three additional conserved parcels, resulting in 11.2 acres of additional impact to conserved lands compared to the Preferred Alternative. Alternative 2 would require crossing the Appalachian Trail on Route 27 in the Town of Wyman. An overhead or direct bore underground crossing of the Appalachian Trail on Alternative 2 would require the acquisition of an easement from the NPS and an overhead crossing would require a 150-foot wide swath of tree clearing across the trail corridor where no transmission line corridor currently exists. Otherwise, underground installation of the DC transmission line would be required within the ROW of State Highway 27. Both options are prohibitively expensive.

In comparison, the Preferred Alternative crosses the Appalachian Trail corridor within an existing transmission line corridor and is adjacent to an existing gravel road. CMP owns the land where the Appalachian Trail is located on Section 222. CMP acquired the rights in fee circa 1950. It later conveyed an easement to the NPS, but retained fee ownership, and specifically retained the right to construct overhead electric and communication transmission lines for the entire 300-foot wide corridor when the NPS purchased the trail corridor easement. CMP would only require an additional 75 feet of tree clearing for the installation of the overhead transmission line for the Preferred Alternative.

Undeveloped Right of Way

The Preferred Alternative would require 53.5 miles of currently undeveloped right of way to be developed, compared to 17.3 miles of currently undeveloped right of way required for Alternative 2.

Clearing

The Preferred Alternative would require clearing 1,823 acres, compared to Alternative 2, which would require clearing 1,670 acres.

Stream Crossings

The Preferred Alternative would cross 115 streams, while Alternative 2 would cross 123 streams. CMP's standard construction practice is to install temporary equipment spans over streams and to avoid all in-stream activities. Consequently, the primary potential impacts to stream habitat are sedimentation and insolation. CMP mitigates the potential for these impacts by installing erosion and sedimentation controls, by routine cleaning of temporary crossing (construction mats) spans, and by maintaining riparian buffers. Stream crossings are slightly higher for Alternative 2.

Transmission Line Length

The Preferred Alternative transmission line corridor is 146.5 miles, whereas the Alternative 2 transmission line corridor is 138.5 miles.

NWI Mapped Wetlands

The Preferred Alternative crosses 263 wetlands and impacts 76.3 acres of wetlands, whereas Alternative 2 crosses 283 wetlands and impacts 113.3 acres. The primary impact to wetlands from construction of the Project will be the conversion of forested wetland to early successional scrub-shrub and meadow cover types. Alternative 2 would entail significantly more forested wetland conversion and temporary wetland impacts than the Preferred Alternative. As a result, oOther than a minor amount of permanent fill associated with structures placed in wetlands where no siting alternatives are available, the permanent loss of wetlands from construction of the Project on either the Preferred Alternative or Alternative 2 is negligible.

Deer Wintering Areas

DWAs crossed, and converted, are virtually identical between the Preferred Alternative and Alternative 2. There is no significant environmental advantage to either route with respect to DWAs.

Inland Waterfowl and Wading Bird Habitat

The Preferred Alternative crosses 12 IWWHs and would require conversion of 22.7 acres of IWWH, while Alternative 2 crosses 12 IWWHs and would require conversion of 16.5 acres. There is no significant environmental advantage to either route with respect to IWWHs.

Public Water Supplies within 500 Feet

One public water supply is located within 500 feet of both routes. There is no significant environmental advantage to either route with respect to public water supplies.

Significant Sand and Gravel Aquifers

The Preferred Alternative crosses 12 significant sand and gravel aquifers, while Alternative 2 crosses 10 significant sand and gravel aquifers. Impacts from the construction and operation of a transmission line are unlikely to impact aquifers due to the short duration of equipment operation and the implementation of environmental controls, and the spill reporting and cleanup procedures utilized by CMP and its contractors during construction.

Parcel Count Total

The Alternative 2 corridor would require CMP to acquire title, right, or interest in 34 parcels of land. In contrast, the Preferred Alternative requires the acquisition of rights in only seven parcels. CMP has acquired the rights for all seven parcels.

Preferred Alternative vs. Alternative 2 Summary

Alternative 2, while slightly shorter and containing less new corridor than the Preferred Alternative, has more wetland and stream crossings than the Preferred Alternative and would create more significant environmental impacts as well as present severe land acquisition and social impact issues.

Approximately 34 parcels would need to be acquired, including rights across the Penobscot Indian Nation, the Bigelow Preserve, and the Appalachian Trail corridor. Past attempts by others, including Highland Wind and Foster Mountain Wind (a/k/a West Hills Wind), to develop transmission and generation in this area have not been successful, due in part to local opposition; therefore, the acquisition of private land in these areas is expected to be difficult.

In addition, Alternative 2 transmission structures would likely be visible from points on the Appalachian Trail and other trails on the Bigelow Preserve and from the Sugarloaf Mountain Ski area. Based on recent National Park Service objections to the proposed overhead transmission line associated with the Kibby Mountain Wind generator lead, an overhead crossing near the Appalachian Trail on Route 27 in the Town of Wyman would likely be opposed by the National Park Service and is therefore unlikely to be permittable.

For these reasons, Alternative 2 is more environmentally damaging to the aquatic ecosystem than the Preferred Alternative and is not the LEDPA.

8.3.2.2 Underground HVDC Transmission Alternatives

It was so obvious that undergrounding would not meet the Project purpose or otherwise be practicable that CMP did not initially include it as an alternative in the application materials filed with the USACE. In other words, installing additional portions of the transmission line underground is not reasonable or feasible because the costs and logistics of doing so would defeat the purpose of the Project.[39] The

[39] MDEP/LUPC Hearing: Dickinson Rebuttal at 2-3, 9-10, 13; Tribbet Rebuttal at 5; Tribbet Supplemental at 4-6; Hearing Day 1 Transcript at 285:13-287:3 (Dickinson).

alternative of burying the transmission line is not practicable because it would result in the NECEC not moving forward.[40] Nevertheless, CMP provides the following evaluation of the underground alternatives.

Underground construction types include direct burial, concrete encased duct bank installation and trenchless installations. In order to meet the power transfer and reliability requirements for the Project an underground installation would require two cables per pole, with an installed spare, for a total of five polymer insulated power transmission cables and two fiber optic cables. (In specific areas with limited trenchless installations a single cable per pole is sufficient to meet the load, but to connect two cables per pole to one cable per pole requires construction of above grade terminal stations; construction of terminal stations would have significant additional cost and natural resource impacts.) The cables are limited to approximately 2,500-foot shipping lengths, requiring the cables to be jointed or spliced approximately every 2,200 feet. Jointing the cable requires weather- and humidity-controlled enclosures. Installing the entire line underground would require an estimated 390 jointing locations with five joints at each location.

When transitioning between overhead and underground transmission, termination stations are required to terminate the underground cable and connect to the overhead lines. Termination stations would be approximately 135 feet by 135 feet and include overhead line dead-end structures, surge arrestors, and termination stands. These stations would appear similar to a substation, with fencing and crushed stone surfacing.

Direct Burial

The lowest cost underground installation method is direct burial. In this type of installation, a trench the full length of the cable shipping length is opened using an excavator. In areas with shallow bedrock, trenching will require blasting, hoe ram, or similar excavation methods. The cables are placed in a single row in a sand bedding layer approximately one foot deep in the bottom of the trench. Above the sand bedding layer a protective concrete slab would be poured and the trench above the slab would be backfilled with native soil. A typical trench would be approximately five feet wide at the bottom with sloping sides for a minimum surface width of 12 feet, increasing when trench depth increases. The cables would be installed with a minimum depth of 60 inches to the top of bedding layer for a minimum depth of six feet to the bottom of the trench. In areas where the cable crosses other below ground infrastructure the cable would need to be deeper.

[40] MDEP/LUPC Hearing: Dickinson Rebuttal at 13; Hearing Day 1 Transcript at 248:12-15 (Dickinson); Hearing Day 6 Transcript at 441:15-442:5 (Dickinson).

At each jointing location a large excavation, approximately 60 feet long, 20 feet wide, and seven feet deep would be opened. A concrete pad would be poured in the bottom of the excavation. Temporary structures would be erected over the jointing locations. Once the cables have been jointed, precast concrete enclosures approximately 12 feet long and 4 feet wide would be placed over each joint for additional protection and the jointing pit would be backfilled with sand and native soil.

The direct burial installation method requires several thousand feet of trench and a clear work area approximately 75 feet wide to stay open while the cable is installed and jointed. This generally makes direct burial unsuitable for installation within roadways due to the impacts to users of the road, large installation area, and insufficient protection from damage due to future utility or road construction.

Concrete Encased Duct Bank

In roadways, shared ROW, or other exposed areas, cable systems are typically installed in concrete encased duct bank. In this type of installation, several hundred feet of trench is opened using an excavator. In areas with shallow bedrock, trenching would require blasting, hoe ram, or similar excavation methods. Polyvinyl Chloride ("PVC") conduits would be installed using spacers in the bottom of the trench, and concrete would be used to encase the conduits. Above the concrete the trench would be backfilled and topped with pavement.

Duct bank would include five conduits for the power cables, two conduits for the fiber-optic cables, and one spare conduit installed in two rows of four conduits. The trench would be approximately five feet wide. Trenches for duct bank are typically shored, keeping the width the same at the top and bottom. The duct bank would be installed with a minimum of 60 inches to the top of the concrete encasement. The encasement would be approximately three feet deep for a minimum trench depth of eight feet. In areas where the cable crosses other below ground infrastructure the cable would need to be deeper.

At each jointing location a pair of precast jointing bays, approximately 33 feet long, 10 feet wide, and 10 feet deep (roughly the size of a school bus) would be buried. The jointing bays would be buried completely, with access provided by two 30-inch manhole entries per vault. Additional smaller handholes, approximately two feet wide by four feet long, would be required for the installation of the fiber optic cables at the jointing locations.

Duct bank construction typically requires a 30-foot wide work area along with space for an access road. At the jointing locations the work area would need to be approximately 10 feet wider to allow for installation of the jointing bays.

Once the duct bank system is complete the cable would be pulled into the duct bank system from the jointing bays. Cable installation does not require re-excavating at the jointing bays. The cable would then be jointed in the vaults.

Trenchless Installations

In areas where surface obstacles such as highways, railroads, wetlands, or waterways would prevent installation by direct buried or trenched duct bank, trenchless installation methods such as Horizontal Directional Drilling ("HDD") can be used. While there are other trenchless methods available, HDD is the lowest impact trenchless method for the conditions present on the NECEC Project. Trenchless installation methods are two to 10 times more expensive than trenched installations and 8 times more expensive than overhead installations. Trenchless installation methods are susceptible to disruption due to variable, unfavorable, and unexpected subsurface conditions such as rock, boulders, or cobbles. As discussed below, trenchless installation for the Project is expected to be at the higher end of the cost range due to access constraints, subsurface conditions, and required site preparation.

HDD operation would require a temporarily cleared work area on each side of the installation, approximately 100 feet wide and 250 feet long. The pipe to be pulled into the HDD would need to be assembled into a single string in a cleared, mostly straight area the length of the crossing and approximately 30 feet wide.

HDD installations would typically be connected by duct bank to nearby joint bays before continuing as either duct bank or direct buried installation or to a termination station for transition to an overhead configuration.

Considerations for the Underground HVDC Transmission Alternatives

Cost

Installing transmission lines underground is much more expensive than overhead. During the NECEC Project MPUC CPCN proceeding, CMP witness Christopher Malone testified that the cost of undergrounding is "roughly three to four times the cost of overhead."[41] Additionally, during the MPUC proceeding NextEra's own expert witness Dan Mayers acknowledged the substantial costs of burying transmission line.[42]

[41] MDEP/LUPC Hearing: See footnote 181 on page 61 of CMP's PUC Reply Brief at: https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2017-00232
[42] MDEP/LUPC Hearing: See page 61 of CMP's PUC Reply Brief at: https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2017-00232

This significant cost factor is further supported by "Overall Cost Comparison Between Cable and Overhead Lines," by Robert Benato and Domenico Napolitano, published in Electra, dated December 2012. In that study, the minimum incremental costs are shown to be about three times more for underground installation compared to overhead installation based on direct burial; costs for undergrounding can be higher depending on the Project complexity.

The preceding sources are based on general information. To better characterize the impacts on the NECEC Project, Black & Veatch on behalf of CMP prepared conceptual level estimates for installing the line underground on the proposed route and an alternate underground route that uses existing overhead corridor and existing roadways as much as possible. The alternate underground route that was evaluated is described in Justin Bardwell's Pre-Filed Rebuttal Testimony prepared for the MDEP/LUPC hearing,[43] and follows CMP's existing ROWs for 89 miles and would follow Route 201 and turn west along Spencer Road for a total of 59 miles before reaching the Canadian border. Availability, feasibility, and practicability of co-locating with Route 201 and Spencer Road are further described in Section 8.3.2.3.

To install the entire 146.5 miles of HVDC transmission line underground on the proposed route would cost approximately $1.9 billion.[44] To install the 53.5-mile new corridor portion of the Project underground along the proposed route would cost approximately $750 million.[45] To install the line underground on the alternate route would cost approximately $2.1 billion.[46] This is approximately 5 to 7 times the estimated cost of overhead transmission construction. These are preliminary estimates and do not include costs for the convertor station, interconnecting lines, upgrades to other transmission and substation assets, and indirect costs such as CMP and Avangrid personnel.

Total cost for constructing the Project with underground lines would be $2.6 billion on the current route or $2.8 billion on the alternate underground route, approximately three times the currently estimated Project cost. The total project cost for constructing the new corridor portion of the proposed route underground, as noted above, would be $1.6 billion. In each scenario, the underground alternative is economically impractical, relative to the overall cost of the Project as proposed and contractually agreed to through the Massachusetts RFP solicitation. As explained below, environmental impacts would be potentially more damaging to the aquatic ecosystem in an underground configuration. As a result, even when considering the costs of compensatory mitigation and other concessions made to appease public

[43] MDEP/LUPC Hearing: Bardwell Pre-Filed at 9.
[44] MDEP/LUPC Hearing: Underground Cost Estimate, Proposed Route, attached as Exhibit CMP-11-B.
[45] MDEP/LUPC Hearing: Underground Cost Estimate, New Corridor Only, attached as Exhibit CMP-11-C.
[46] MDEP/LUPC Hearing: Underground Cost Estimate, Underground Alternate Route, attached as Exhibit CMP-11-D.

interest concerns, the increased cost of undergrounding would not be offset by any savings that might be realized to the extent that the underground alternative would become economically practicable.

Environmental Impacts

Underground transmission installations have different impacts from overhead transmission. Specific impacts are dependent on the aquatic ecosystems and the protected and sensitive resources present at specific locations. Underground transmission typically requires less clearing width than overhead transmission, but still requires a significant area to be cleared and for the majority of that area to be grubbed and graded. For the NECEC Project a cleared width of 150 feet is required for overhead lines and a minimum cleared width of 75 feet would be required for trenched underground lines. However, the surface disruption caused by trenched underground transmission line construction is continuous along its length rather than intermittent and widely spaced at each overhead structure installation location. In areas of uneven or side-sloping terrain, grading and significant cuts and fills would need to occur to provide a safe travel surface for equipment and personnel during construction, operation and maintenance. The additional surface disruption would require additional control measures for soil erosion, sedimentation, and dust generation during construction, and poses a risk that those control measures could be damaged during an extreme weather event. Further, underground installations involving trench excavation entail significantly more trench de-watering than individual transmission structure excavations, resulting in an increased risk of sedimentation in wetlands and waterbodies.

Clearing width for overhead transmission is determined based on electrical clearances and vegetation management. In underground transmission applications, clearing width is determined based on a combination of operational and maintenance requirements, preventing damage due to root growth, and preventing future vegetation impacts to line capacity. In both installations shorter vegetation is not a concern.

Preventing damage due to root growth and preventing future impacts to the line capacity of underground transmission lines are both driven by the roots of large trees. The roots of large trees remove moisture from the soils and under drought conditions can increase the thermal resistance of the soils, causing an unacceptable temperature increase in the cables. While it varies with the species of tree, most trees have a root area of impact similar to the crown spread (drip-line) of the tree. Maine has several species of trees with crown spreads exceeding 70 feet.[47]

[47] Forest Trees of Maine, Maine Department of Agriculture, Conservation and Forestry.

Surface disruption during construction for overhead transmission includes access roads and work sites at each structure, with minimal impacts between structures. Surface disruption during construction for underground transmission is continuous and at the full 75-foot wide work area unless higher cost and higher risk trenchless methods are used. Underground installation would create significantly more subsurface disturbance, including a marked increase in the amount of blasting that would be needed along the length of the installation, as opposed to isolated blasting required for transmission line structure installation. Blasting to the extent needed to install the transmission line underground would add significant risk to the hydrology of wetlands and waterbodies along and adjacent to the project route.

The inspection, maintenance and repair requirements for underground transmission lines requires access to every jointing location along the route. This requires permanent access roads to be maintained to each jointing location. For overhead lines, permanent access roads to each structure are not required. As a result, the extent of permanent wetland fill to construct the Project in an underground configuration would be significantly higher than an overhead design. In addition, for an underground design, permanent stream crossings would need to be constructed and maintained.

Overhead lines can generally avoid or minimize direct wetland impacts by locating structures outside of wetlands and spanning sensitive environmental areas. Underground transmission installation, being continuous, can only avoid wetlands and waterways by using higher cost and higher risk trenchless methods.

Public Impacts

In general, impacts due to construction of underground transmission lines will have a larger impact on the general public than overhead transmission lines. This is particularly significant when the line is being installed in public roadways.

Underground transmission line construction in roadways will have significant public impacts. Most of the roads in the Project area are two lane roads. Underground construction would require closure of half the road, resulting in alternating one-way traffic.

Underground transmission line construction is slower than overhead construction with significantly more construction activity along the route. Construction at each splicing location would require 2-3 weeks of continuous activity. Direct buried cable sections would require continuous work along the 2,200-foot-long trench for approximately three weeks. Duct bank construction would advance at approximately 200 feet per day. HDD operation duration would depend heavily on the subsurface conditions and length of the crossing, with each drilling location being occupied 8 to 24 weeks.

Additional Risks Associated with Underground Construction

Underground transmission construction is particularly susceptible to cost and productivity impacts due to unforeseen subsurface conditions, such as shallow bedrock, boulders, cobbles, and unstable soil or bedrock conditions. While overhead transmission construction allows targeted soil sampling and borings at each proposed structure location, underground transmission is continuous and it is therefore impossible for borings to identify all subsurface conditions in advance of construction.

The most common risk for below grade construction is encountering bedrock shallower than expected. In areas with shallow bedrock, trenching would require blasting, hoe ram, or similar excavation methods.

Trenchless construction methods in particular are very susceptible to unforeseen pockets of gravel or cobbles, which may collapse into the boring, binding the drill tooling or conduit piping.

The amount of excavation required for underground transmission makes progress and productivity particularly susceptible to extreme rain events.

Overhead faults are often due to debris (e.g., limbs, trees) that is dislodged during the fault or quickly removable, allowing the line to return to service quickly. When a fault occurs on an overhead transmission line it would automatically be isolated at the HVDC converter station. The overhead line would be then be drained of any remaining energy and within seconds the line would automatically be restored to service, assuming the fault was temporary. This automatic return to service process is referred to as reclosing the line. With an underground cable good utility practice necessitates not reclosing on the cable segment, because most underground cable faults result from inherent damage to the cable insulation and require repair before being restored to service. This practice helps to avoid additional damage to the cable and prevents public exposure to potentially energized cable that has been exposed and damaged due to, for example, improper excavation by a third party.

When overhead and underground segments are combined in a single transmission line a typical solution to allow reclosing would be to establish larger cable termination stations with a full local protection system that can accurately determine the location of the fault and prevent the line from automatically reclosing if the fault is expected to be in the buried cable segment. Operation of such protection and monitoring equipment requires AC electrical station service to supply power. The cost of establishing AC station service may be excessively high, and thus not practicable, due to the distance from existing AC electrical distribution service.

As an alternative approach to such local protection equipment, remote monitoring equipment could be used to estimate the fault location. These estimates of the fault location are not precise. CMP would need to block automatic reclosing for faults near the underground portion, including some length of the overhead line. Estimates from converter vendors indicate that the length of overhead line where faults would not be able to be reclosed would be approximately one mile on each side of the underground cable, or two miles in total.

This configuration would prevent CMP from quickly restoring the line in the case of faults in the overhead portions of the line adjacent to underground sections, reducing overall line availability and reliability. CMP has accepted this reduction in reliability for the upper Kennebec River underground cable section, but every additional section of underground would add more segments of overhead transmission line that would not automatically reclose for temporary faults, which would prevent quick restoration of the line and would therefore be inconsistent with the Project's purpose.

Also, while cable faults are less likely with underground cable than overhead lines, they typically result in more significant damage to the cable system, preventing a return to service without difficult repairs. Underground faults are very costly and time-consuming to identify, isolate, and repair, and usually require dispatching heavy equipment to the affected section to repair or replace the cable. The repair time of an underground fault increases in cold weather, with access limitations due to winter ground conditions.

As a result of the above, outages in an overhead line are often restored in a few hours, while outages in underground cables typically require 2 to 5 weeks to restore.

Practicability of Underground Alternatives

Underground installation may, depending on the method used, have some limited reduction in clearing and associated impacts on wetlands and vernal pools compared to overhead construction, while increasing surface disruption outside of wetlands and requiring higher cost and risk installation methods. The application of underground installation on a smaller scale would require termination stations on each side of each installation and would increase environmental impact through the need to establish permanent access roads to each termination station constructed.

CMP has comprehensively analyzed the option of undergrounding all or portions (including the entirety of the new corridor area) of the NECEC Project transmission line and concluded that undergrounding is not a practicable alternative that would be less damaging to the environment. In addition, the purpose of the Project is delivering clean energy generation from Québec to New England at the lowest cost to

ratepayers, which delivery requires availability of at least 90% every month. Underground construction of the line or additional portions of the line would have caused exorbitant incremental costs as part of CMP's response to the Massachusetts RFP, additional construction challenges compared to the current overhead design, and substantial operational and availability risks. With the exception of the HDD of the Upper Kennebec River, underground alternatives have been eliminated from further consideration due to engineering constraints, cost, and increased public and environmental impacts.

8.3.2.3 Co-location of the HVDC Route with Existing Transportation Routes

CMP evaluated co-location of the HVDC transmission line with existing transportation corridors. These alternatives include Maine State Route 27 ("Route 27") and U.S. Route 201 ("Route 201"), Spencer Road, and the Central Maine and Québec Railway ("CM&Q Railway").These alternatives, as well as the Jackman Tie Line discussed in Section 8.3.2.4, were considered as potential hybrid options, as the use of any of these transportation routes would need to tie into CMP's existing transmission system or require some portion of new corridor to route into the existing system.

Route 27

Co-locating the HVDC transmission line with Route 27 would require it to be installed within or parallel to this highway from the Canada border to a point at which the transmission line would join CMP's existing Section 215 transmission line corridor, associated with the HVDC Alternative 2 (described in Section 8.3.2.1), in Carrabassett Valley (See Figure 8-3). The width of the Route 27 ownership varies from four to eight rods (66 to 132 feet). An overhead transmission line such as NECEC requires a 150-foot-wide corridor; consequently, there is insufficient space for an overhead transmission line along Route 27. An underground transmission line of the capacity to transmit the load projected for this transmission line would require excavating a trench approximately six feet deep, five feet wide at the bottom and generally 12 feet wide at the top. Approximately 37.5 feet from the center of the trench must remain tree free to maintain the integrity of the cables. The MDOT Utility Accommodation Rules (17-229 CMR Chapter 210) do not allow the construction of underground electrical services below highways. Underground and overhead electrical services must be constructed within the road shoulder or sidewalk. Even at the widest highway corridor width, there is insufficient space for an underground line if the trench is placed outside the highway ditch line. CMP contacted MDOT in June 2019 for further information as requested by the USACE in its May 15, 2019 Information Request. MDEP has declined to respond as of the date of this application package, however any project proposed within MDOT's roadways must comply with the MDOT's standards and rules. There are over 660 parcels along Route 27 between the

Bigelow Substation located at the north town line of Carrabassett Valley and the Québec border with the majority of these located in the villages of Stratton and Eustis. Rights across the road frontage of an estimated 300 parcels, many of which are residential, would be required. Assuming a probability of success of 95% for each parcel produces a Project success probability of .00002% (.95^300=.0000002 or .00002%). Even using an extremely aggressive probability factor of .995 still produces a project success probability of 22.2%. In addition, this route would require the acquisition of additional width along the Section 215 transmission line corridor between Bigelow Substation and Wyman Dam through the Bigelow Preserve Public Reserved Land.

Acquiring additional width along Route 27 is not practicable. Because of the highway's proximity to residential structures, the use of eminent domain may not be available to CMP in these areas pursuant to 35-A M.R.S. § 3136, as the Project may be within 300 feet of inhabited dwellings. Additionally, MDOT rules further constrain CMP's ability to co-locate within the existing highway ROW, effectively eliminating this as a practicable alternative. For these reasons, the Route 27 alternative was not considered reasonable.

Route 201

Route 201, the Old Canada Road National Scenic Byway, is designated as both a Maine State Scenic Byway and a National Scenic Byway.[48] This 78.2 mile-long Byway follows the Kennebec River within Segments 1 and 2 of the Project. This section of road is also part of the Kennebec-Chaudiere Heritage Corridor, which links Fort Popham to the south with the City of Québec to the north.

Co-locating the HVDC transmission line with Route 201 would require the Project to be installed within or parallel to this highway from the Canada border to a point at which the transmission line would join CMP's existing Section 222 transmission line corridor, associated with the Preferred Alternative (described below), near Wyman Dam in Moscow (see Figure 8-3). The spatial constraints for the co-location of the transmission line within the Route 201 corridor are nearly identical for those described above for Route 27.

There are over 510 parcels along Route 201 and Lake Moxie Road between CMP's transmission line (Section 222) and the Québec border, with the majority of these parcels located in the villages of West Forks, Jackman, and Moose River. Rights across the frontage of an estimated 225 parcels, many of which

[48] The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The U.S. Secretary of Transportation recognizes certain roads as All-American Roads or National Scenic Byways based on one or more archeological, cultural, historic, natural, recreational and scenic qualities. http://www.byways.org/

are residential, would be required. The lower parcel count along this route produces a slightly higher probability of Project success, but still only 32.4% at a probability of 99.5% for each parcel.

Similar to Route 27, acquiring additional width along Route 201 is not practicable. Because of the proximity to residential structures, the use of eminent domain may not be available to CMP in these areas. As stated previously, Maine DOT rules further constrain CMP's ability to co-locate within the existing highway ROW, effectively dismissing this as a practicable alternative. For these reasons, the Route 201 alternative was not considered reasonable.

Existing Private Logging Roads

The network of logging roads in this region are privately owned and on private forest land. These roads are temporary as they are used and maintained only when forest harvesting is occurring in the vicinity and are often relocated by the private landowners, as needed. These roads do not offer the connectivity or sufficient width required to be useful as a corridor and generally terminate somewhere in the woods. For these reasons, the only logging road considered as a potential practicable alternative would be the Spencer Road.

While also a privately owned forest management road, Spencer Road is used year-round to access adjacent private timberlands for forest management purposes. CMP first approached the then primary forest landowner along Spencer Road, Plum Creek Maine Timberlands LLC ("PCT"), in 2014 to discuss a potential alignment of Segment 1 of the Project west of Route 201 along Spencer Road (See Figure 8-3). PCT specifically did not want a transmission line located along Spencer Road because such a transmission line, whether overhead or underground, would limit PCT's ability to ditch, blast, create, and use landings, operate heavy equipment, or relocate the road to facilitate its forest products business. Additionally, PCT had concerns that activity associated with transmission line construction, whether overhead or underground, would create congestion and negatively impact its ability to access its land and transport timber. Thus, the use of Spencer Road as an alternative alignment was unavailable to CMP.

PCT was subsequently acquired by Weyerhaeuser Company ("Weyerhaeuser) in February of 2016. CMP and PCT had previously entered into an option to purchase a corridor substantially along the Preferred Alternative route. The option was amended five times with PCT and once with Weyerhaeuser before CMP acquired the corridor. At no time during the negotiations with Weyerhaeuser for lands needed to complete the acquisition of the Preferred Alternative did the new owner indicate that it had reconsidered the availability of lands or show a preference for a co-located transmission line along Spencer Road.

On May 15, 2019, CMP received a data request from the USACE, suggesting that to fully dismiss the Spencer Road alternative, the new landowner should be approached. CMP has since asked Weyerhaeuser if acquiring a corridor for either an overhead or underground transmission line along the Spencer Road would be possible. The landowner responded that in order to determine if there was an interest in selling, CMP would need to follow the same process that was used when acquiring the existing corridor from the landowner. On CMP's part, it would need to negotiate the terms and conditions, including the purchase price, for these lands and then determine the practicality of making a purchase. The process CMP followed to acquire the new corridor associated with the Preferred Alternative is generally as follows:

- Obtain right of entry.
- Develop a preliminary alignment.
- Make a formal offer to purchase including price and conditions of purchase.
- If the proposal were acceptable in principle, the landowner and CMP would execute a contract detailing the terms, conditions and purchase price. The process would not proceed until or unless there was agreement between CMP and the landowner.
- During the contract period, CMP would perform resource surveys and due diligence.
- CMP would most likely request one or more amendments to the contract based on the results of the resource surveys and due diligence. If the changes were acceptable to the landowner, the contract would be amended. The process would not proceed until or unless there was agreement between CMP and the landowner on all terms and conditions including any adjustment to purchase price based on the contract changes.

In short, although the current landowner has not ruled out the possibility of conveying to CMP access rights along Spencer Road for a transmission line, it has not indicated a current willingness to do so, absent significant additional work and negotiations. Until the landowner and CMP have completed these steps, it is not possible to determine whether or not these lands are available for acquisition. CMP started the acquisition of the Preferred Alternative in early 2014 and completed the purchase in the fall of 2107. It would take a similar period of time to acquire a new corridor adjacent to Spencer Road. Also, to try to convince the current owner to reconsider, at this late date (years after it was initially ruled out due to availability), is not practicable because the logistics and time required of acquiring the land would result in the NECEC not moving forward, i.e., it would no longer meet the Project purpose and need.

CM&Q Railway

The CM&Q Railway crosses the Maine – Québec border about 2.6 miles north of the Preferred Alternative border crossing location and generally follows the Moose River and the shores of Holeb, Attean, and Big Wood ponds easterly about 28 miles to Jackman. From Jackman, the railway continues

easterly along the Moose River, Long Pond, Brassua Lake, and the shore of Moosehead Lake about 40 miles to Greenville Junction (See Figure 8-3). The railway corridor does not have sufficient width for either an underground or overhead transmission line. The railway is still considered active, so any use of the railway corridor must assume that the track needs to remain intact. The ownership is generally six rods (99 feet) wide, which does not provide the area needed for either an underground or overhead electric transmission line outside the toe of slope of the roadbed. Additional land or land rights would need to be acquired for either an overhead or an underground electric transmission line. A very rough estimate of the additional land area needed is 35 to 50 feet for an underground line and 50 to 75 feet for overhead line. The railway is close to the shore of Attean Pond and very close to the shore of Holeb Pond, both part of the Moose River Bow Trip, an iconic Maine canoe trip. The railway is also close to the shore of Big Wood Pond in Jackman. Much of the land next to the railway is either subject to a conservation easement, is State owned, or is developed as recreational properties, including virtually all the land adjacent to the railway in Attean Township as well as a large part of Holeb Township. These lands have high recreational use. The probability of successfully acquiring the required title, right, or interest in the lands needed to develop a transmission line along a currently active railway is very low, would be very costly, and would require several years at best.

Finally, at no point does the railway cross or come close CMP's Harris Dam to Lewiston transmission line corridor. As a result, the only possible route using the railway as a co-located corridor would be to join it with the Route 201 alternative in Jackman. As discussed previously, the Route 201 alternative is not a practicable alternative.

8.3.2.4 Co-location of the HVDC Route with Existing Electric Distribution Corridors

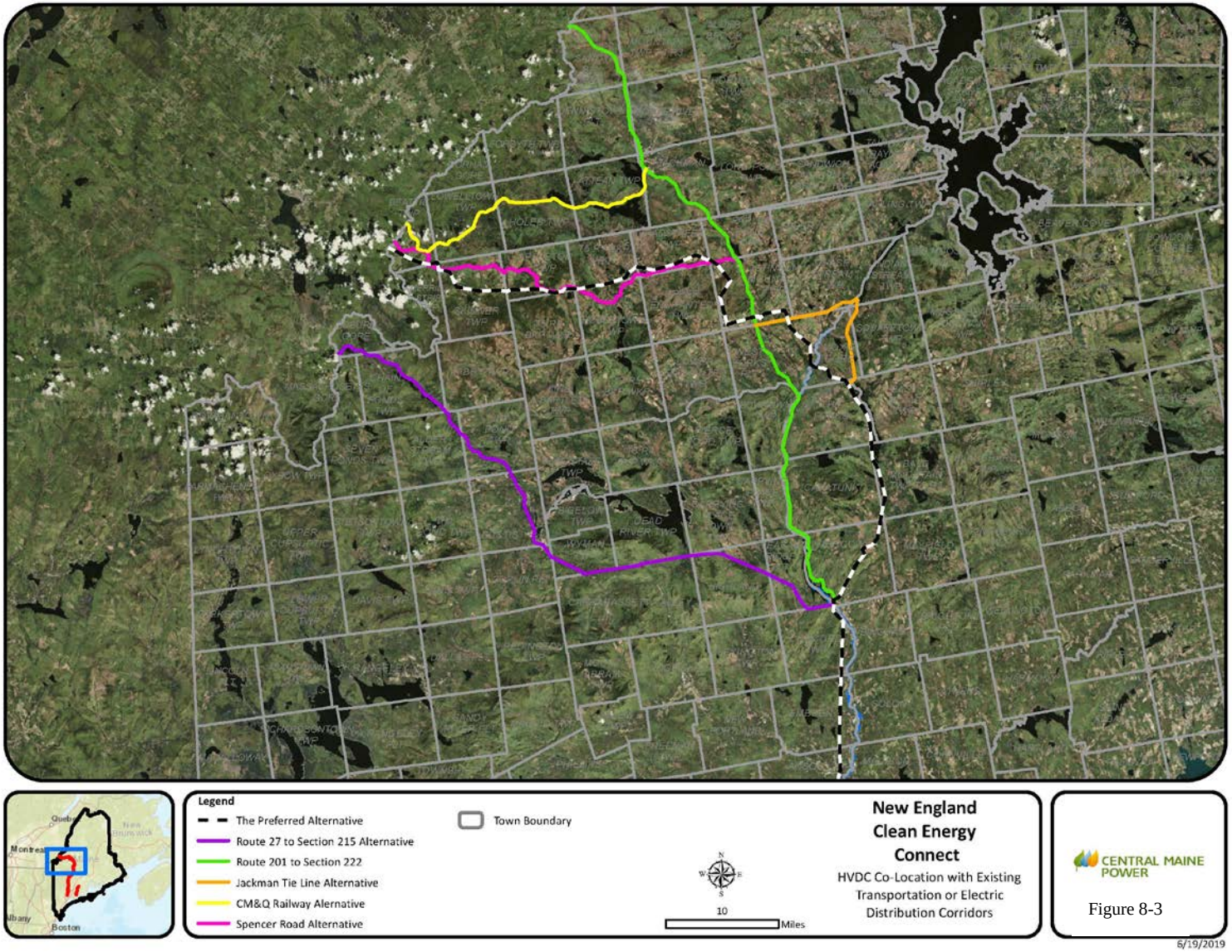
Jackman Tie Line

The Jackman Tie Line is an electric distribution line that extends from Harris Dam west to a point on Route 201 in West Forks Plantation south of the boundary of Johnson Mountain Township. From that point to the Town of Jackman, about 18 miles, the Jackman Tie Line is a standard roadside distribution line located within the highway limits of Route 201. The Jackman Tie Line terminates in Jackman approximately 16 miles from the Canada border (See Figure 8-3). Not only would new corridor need to be acquired through the towns of Jackman and Moose River, but corridor would need to be acquired along Route 201, a designated Maine State Scenic Byway and a National Scenic Byway, for the entire distance from Jackman to West Forks Plantation. In addition, the Jackman Tie Line corridor between Harris Dam

and Route 201 would need to be expanded through two conservation easements and across the State-owned Cold Stream Forest, which specifically prohibits commercial development.

As stated previously, a co-located corridor along Route 201 is not a practicable alternative. Additionally, expansion of the portion of the Jackman Tie Line from Route 201 to Harris Dam is not possible because existing deed covenants and restrictions associated with conservation lands along that route prohibit this type of development.

Figure 8-3: HVDC Co-Location with Existing Transportation or Electric Distribution Corridors



8.3.2.5 Border Crossing Alternatives

The preferred border crossing location was identified through the consideration of routes on both sides of the border that would accommodate the needs of both CMP and HQ while minimizing the length of transmission line to do so, thereby minimizing the environmental impacts associated with a new corridor.

In evaluating routing and border crossing alternatives, the following criteria were considered: conserved lands; undeveloped rights of way; required clearing; total parcel count; land availability; number of stream crossings; transmission line length; National Wetland Inventory mapped wetlands; deer wintering areas; inland waterfowl and wading bird habitat; public water supplies within 500 feet; and significant sand and gravel aquifers. Avoiding or, alternatively, minimizing impacts to these resources, resulted in the preferred transmission line route and, necessarily, the preferred border crossing. Alternative border crossings would have caused or increased impacts to one or more of the listed resources or attributes.

In addition, sufficient access to a corridor was a primary consideration, and the preferred border crossing has relatively good existing access on both sides of the border. An alternative border crossing farther south would have limited access in an area with higher elevations. Further, a border crossing south of the current location would require land acquisition in Merrill Strip Township. As explained below in Section 8.3.2.7, CMP was unable to negotiate a mutually acceptable alternative alignment with the landowner who owns the majority of property in Merrill Strip Township. An alternative border crossing farther north than the proposed crossing would preferably avoid crossing the P-RR subdistrict at Beattie Pond which would result in increased impact to Passamaquoddy Tribe lands and a significantly longer transmission line.

The availability of lands needed to develop a transmission line and associated sufficient access using an alignment to the south and the development of a significantly longer transmission line route to the north both would entail additional environmental impact beyond what would result from the preferred alignment and border crossing.

Border crossings at Routes 27 and 201 were not considered practicable alternatives for the reasons previously described in Section 8.3.2.5. In addition, Alternative 1 as described in Section 8.3.2.1 included a border crossing in Bowmantown Township. The analysis of Alternative 1 concluded this was not the LEDPA.

8.3.2.6 Outstanding River Segment Crossing Alternatives

Maine law protects certain rivers that, "because of their unparalleled natural and recreational values, provide irreplaceable social and economic benefits to the people in their existing state." 12 M.R.S. § 403. The NECEC crosses the following five locations which are afforded special protection as Outstanding River Segments, as identified in 38 M.R.S. § 480-P and 12 M.R.S § 403:

- Upper Kennebec River
- Kennebec River below Wyman Dam
- Carrabassett River
- Sandy River
- West Branch of the Sheepscot River

CMP considered alternatives to crossing the five Outstanding River Segments in its Applications submitted in September 2017,[49] and provided supplemental information in responses to agency data requests[50] demonstrating that "no reasonable alternative exists" for each river segment the transmission line crosses, also as summarized here.

The Preferred Alternative for the crossing of the Upper Kennebec River is underground, using HDD. The Kennebec River at this location is within an LUPC P-RR subdistrict and is further discussed in detail in Section 8.3.2.7. There will be no views of the Project from this Outstanding River Segment.

All other Outstanding River Segment crossings are within existing transmission line corridors, so any alternatives would require new transmission line corridors and would significantly and unreasonably increase clearing and visual impact for those crossings.[51] Crossing at a new location (i.e., a crossing that is not co-located within an existing transmission line corridor) would have a greater adverse impact on the river, and is therefore not reasonable, because such a crossing would be a new crossing location. By using the existing ROW, additional clearing adjacent to the four Outstanding River Segments crossed aerially by the Project will be limited to a typical width of 75 feet and impacts will be concentrated in locations where transmission lines already cross the rivers.[52]

The underground crossing of the four Outstanding River Segments is not a reasonable alternative given the prohibitive cost and existing overhead transmission lines at those locations. Underground crossings of

[49] *See* NRPA Application, Chapter 2 (submitted to the USACE September 29, 2017).
[50] Responses to Data Requests Letter (submitted March 29, 2018); NECEC Overhead Crossing of the Kennebec River Letter (submitted July 26, 2018).
[51] MDEP/LUPC Hearing: Segal Direct at 35; Berube Direct at 11-12.
[52] MDEP/LUPC Hearing: Segal Direct at 35.

these rivers would have to be accomplished using HDD. Termination stations with permanent access roads would need to be sited on each side of the river to facilitate the transition from an overhead to underground configuration. It is possible that despite best efforts to minimize views of the termination stations, they would still be visible from the river, especially given the existing transmission line corridor and views down the corridor. As discussed in Section 8.3.2.2, trenchless installation methods such as HDD are 5 to 7 times more expensive than standard overhead crossings. Additionally, the Visual Impact Assessment[53] conducted for the Project did not indicate unreasonable impacts or the need for additional mitigation in these areas. For these reasons, the additional cost of HDD installation at the four (4) co-located Outstanding River Segment crossings is not supported by a need to minimize visual impacts, and therefore crossing aerially in these locations is the LEDPA.

8.3.2.7 LUPC P-RR Subdistricts Alternatives

CMP evaluated alternatives to locating the Project in LUPC subdistricts requiring special exception approval. A description of these subdistricts and a discussion of the alternatives evaluated is provided below.

Beattie Pond

Overhead Transmission Alternative

The Project corridor crosses the P-RR subdistrict associated with Beattie Pond, which is classified as a Management Class VI Lake, also referred to as a Remote Pond (Figure 8-4). The criteria to be designated Management Class VI include the following:

a. Having no existing road access by two-wheel drive motor vehicles during summer months within 1/2 mile of the normal high-water mark of the water body;
b. Having existing buildings within 1/2 mile of the normal high-water mark of the water body limited to no more than one non-commercial remote camp and its accessory structures; and
c. Supporting cold water game fisheries.

In addition, the 300 foot wide by 300 foot long, two acre parcel owned in trust by the U.S. Government for the Passamaquoddy Tribe is located within the Beattie Pond P-RR subdistrict, but contains no waters of the U.S. The alternatives discussion below applies to this parcel and factors in to the BIA's consideration of NEPA compliance for its approval of the lease between CMP and the Tribe.

[53] See Site Law Application, Chapter 6 (submitted to the USACE on September 29, 2017).

The P-RR subdistrict associated with Beattie Pond encompasses a ½-mile buffer from the normal high-water mark of the waterbody. Portions of the P-RR subdistrict are located in Beattie Township, Lowelltown Township, Skinner Township, and Merrill Strip Township. Of note, there is an existing, gated road accessible by two-wheel drive motor vehicles within 400 feet of the pond, available during the summer months within the P-RR subdistrict, and signage indicating that the single camp on the pond is accessible by club members only, both of which are inconsistent with the above criteria for classification as a remote pond.

The Project corridor is located within ¼-mile of the high-water mark of Beattie Pond but is located farther away from the pond than the existing road access. The P-RR zoning is intended to protect the pond from permanent improvements in access that could lead to more intensive use or development. The presence of a transmission line corridor at a distance greater than the existing road access will not include permanent improvements that promote more intensive use or development of the pond, and is therefore consistent with the intent of the P-RR zoning.

Views of the Project from Beattie Pond are limited to one transmission line structure that will be located approximately 1,300 feet from the pond. The majority of the structure will be buffered by existing vegetation such that only the tallest portion of the structure will be minimally visible. The structure will be made of self-weathering steel, appearing rusty and brown, which will further reduce contrast in color with the surrounding vegetation when viewed from the pond.

CMP attempted to negotiate an alternative alignment south of the Beattie Pond P-RR subdistrict through Merrill Strip Township but was unable to come to acceptable terms with the landowner; specifically, the landowner requested fifty times market value for this land tract. Re-routing north of the pond to avoid the P-RR subdistrict would result in approximately four miles of additional corridor and associated vegetation clearing and would lead to potentially higher visibility from the pond due to the higher elevations associated with Caswell Mountain. Further re-routing to the east and north of the pond would require significantly more land subject to a lease with the Passamaquoddy Tribe and these lands would contain waters of the U.S. whereas the portion of the Preferred Alternative on the Passamquoddy land does not. Therefore, neither alternative represents the LEDPA.

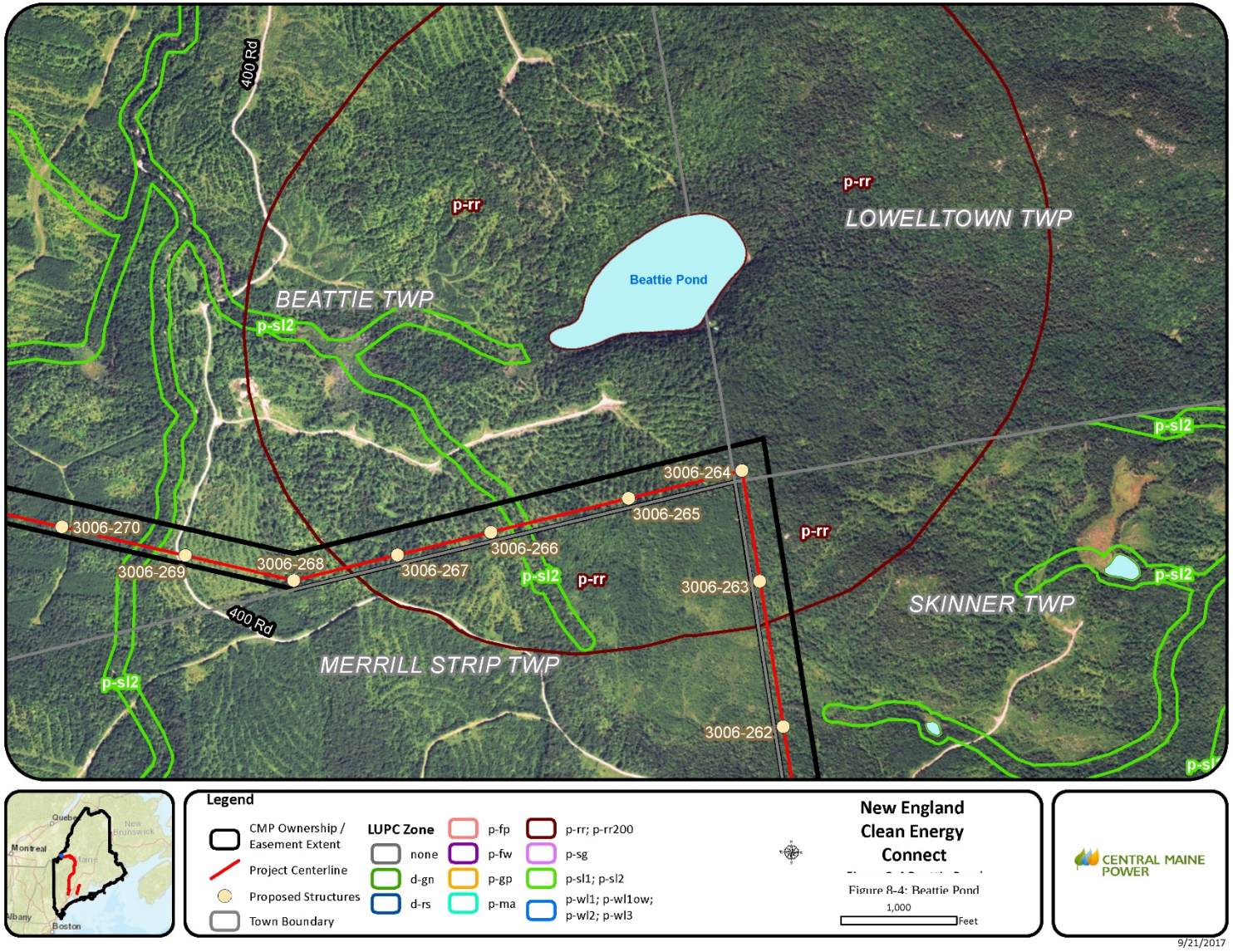
Underground Transmission Alternative

Undergrounding the line in the P-RR subdistrict at Beattie Pond would consist of installing termination stations just outside of the P-RR subdistrict and connecting them with approximately 1.2 miles of direct buried cables, including three jointing locations and crossings of two wetlands by approximately 1,000-

foot long HDD installations.[54] Underground construction would require clearing and continuous surface disruption in the P-RR subdistrict and would cost approximately $15.3 million, $13.2 million of which would be an incremental additional cost to the Project when subtracting associated overhead transmission line costs.[55] In addition to this incremental cost, this short underground cable segment of the NECEC HVDC transmission line at Beattie Pond would require construction of additional access points and would create operational problems for CMP, including limited winter accessibility and protracted service restoration timelines.[56] Undergrounding the transmission line in this area would not be practicable, especially given that the visibility and associated visual impact from the shortened structure previously visible from Beattie Pond will be so minimal.

[54] MDEP/LUPC Hearing: Bardwell Rebuttal at 19.
[55] MDEP/LUPC Hearing: Bardwell Rebuttal at 19; Exhibit CMP-11-F.
[56] MDEP/LUPC Hearing: Bardwell Rebuttal at 19-20.

Figure 8-3: Beattie Pond



Upper Kennebec River

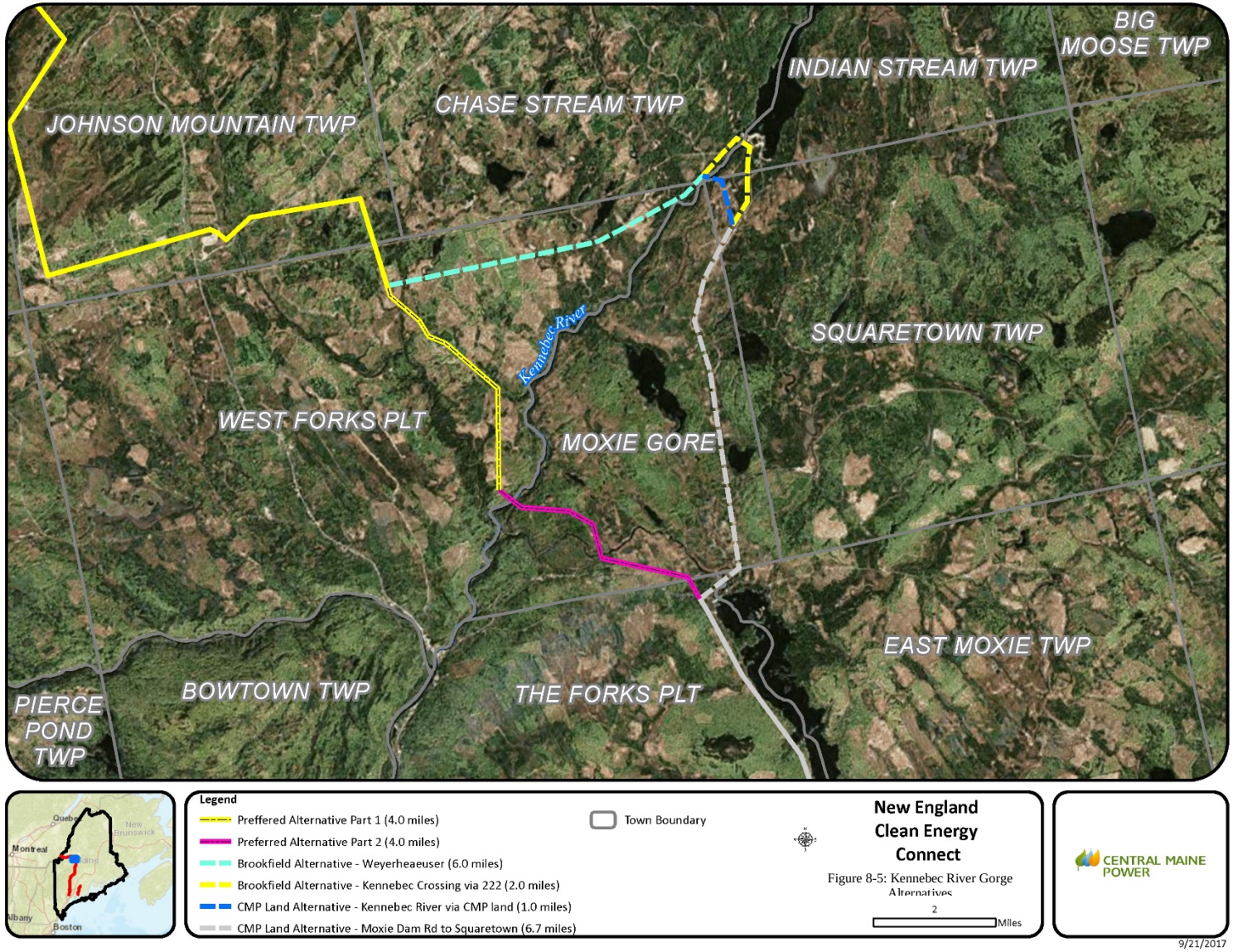
The Project corridor crosses the P-RR subdistrict associated with the Upper Kennebec River in West Forks Plantation and Moxie Gore. The P-RR subdistrict extends 250 feet from the normal high-water mark on both sides of the river. As stated previously, the P-RR subdistricts identified by the LUPC are those areas that provide or support unusually significant primitive recreation opportunities. Whitewater rafting is the primary recreational use in this portion of the river. Notably, the Comprehensive Land Use Plan (LUPC 2010) identifies whitewater rafting as an intensive recreational use.

CMP evaluated two overhead and one underground transmission alternative at the Upper Kennebec River, as discussed in the sections below.

Overhead Transmission Alternatives

Three alternative locations for the proposed crossing of the Kennebec River were evaluated, as shown in Figure 8-5: (1) a crossing north of Moxie Stream between Moxie Gore and West Forks Plantation (the Preferred Alternative), (2) a crossing on CMP land about one mile downstream of Harris Dam (the CMP Land Alternative), and (3) a crossing near the Harris Station powerhouse (the Brookfield Alternative).

Figure 8-5: Kennebec River Gorge Alternative



CMP Land Alternative-13.3 miles

The CMP Land Alternative, represented by the white, blue, and turquoise line shown on Figure 8-5, would follow the existing Section 222 corridor toward Harris Dam. The width of Section 222 decreases from 300 feet to 225 feet at Moxie Dam Road in The Forks Plantation and maintains the 225-foot width north to the Harris Station powerhouse/substation located on Brookfield land at Harris Dam. Section 222 is an H-frame 115 kV line on the eastern half of the corridor. The corridor is owned in fee by CMP to the Harris Dam Hydropower Project ("Hydro Project") line and the remaining distance of about one mile across the Hydro Project is held as an easement. For most of its 6.7 miles, the Section 222 corridor is bordered on the east by the Harris Dam Road and on the west by 40-acre recreational parcels created in a 1980s subdivision. Eight of the subdivision parcels are now subject to a conservation easement and approximately forty parcels remain in private ownership. Also subject to a conservation easement is the Weyerhaeuser Company land in Squaretown Township, located southeast of Harris Dam Road (the Moosehead Region Conservation Easement) and the Hydro Project land located west of Section 222 in Squaretown Township and Indian Stream Township (i.e., the Moosehead Kennebec Headwaters conservation easement).

At the point at which the fee owned portion of Section 222 becomes easement, the CMP Land Alternative would be in new corridor, due west approximately one mile and across the upper gorge. CMP owns a 300 +/- acre parcel located between the Harris Dam Road and the Kennebec River in Squaretown Township and Indian Stream Township and an 85+/- acre parcel on the northwest side of the Kennebec River in Chase Stream Township (i.e., the blue-dashed line on Figure 8-5). CMP reserved the right to place transmission lines across the Kennebec River in this area when CMP placed a conservation easement on its Kennebec River Gorge properties as part of the MPRP project compensation plan.

The Project route would then continue in new corridor approximately 5.6 miles long (i.e., the turquoise line on Figure 8-5). This land would need to be acquired from a private landowner in West Forks Plantation, from the CMP ownership in Chase Stream Township to where it meets the Preferred Alternative.

Brookfield Alternative-14.5 miles

The Brookfield Alternative is similar to the CMP Land Alternative with one exception. Instead of crossing the upper gorge across the MPRP conserved lands the route would cross the river at Harris Dam (see yellow dashed line on Figure 8-5). A transmission line crossing of the Kennebec River at Harris Dam requires the use of Section 222 within the Hydro Project. CMP reserved a 225-foot wide easement within

the Project limits. However, unless the new line is to cross directly over the powerhouse, the transmission line crossing corridor will need to leave the Section 222 corridor south of the first angle point in Section 222. The river crossing would be about 1,200 feet and would require a 90°+/- angle structure on the north side. A new corridor would need to be created on the northwest side of the Kennebec River between the river and the existing Jackman Tie Line (JTL) corridor. The JTL corridor would need to be widened by 200 feet for approximately ¼ mile until the JTL corridor leaves the Indian Pond Project and enters CMP land. About 900 feet of the JTL widening would involve Brookfield land that is encumbered by the Moosehead Kennebec Headwaters conservation easement. The use of this route depends on being able to widen the JTL corridor through the Moosehead Kennebec Headwaters conservation easement in addition to requiring an agreement with Brookfield and FERC to use the other land that is within the FERC Project boundaries and outside the Section 222 easement. Although Section 222 connects to the Harris Substation from the south side of the river and the JTL connects from the north side, there is no transmission line that currently crosses the river in this location.

Greater environmental impacts, relative to transmission line length (i.e., the CMP Land and Brookfield Alternatives are 5.1 and 6.3 miles longer than the Preferred Alternative, respectively), would result from construction of either the CMP Land Alternative or the Brookfield Alternative. The addition of an HVDC transmission line along both alternatives would have a significant visual impact on recreational users of the upper Kennebec Gorge and Indian Pond area. The Brookfield Alternative would be visible to all rafters and private boaters putting in to the Kennebec River and most likely would be directly over the stairway and marshalling area where rafters are given instructions before launching. Both alternatives would present similar perceived visual concerns as the Preferred Alternative and would cost approximately $30 million dollars more than the Preferred Alternative.

Underground Transmission Alternative

An underground transmission alternative at the Upper Kennebec River using HDD technology was evaluated in CMP's September 2017 Applications.[57] CMP estimated that an underground crossing of the Kennebec River Gorge would cost approximately 5 to 7 times more than standard overhead construction and would require additional facilities, known as termination stations. CMP's evaluation concluded that there was a minimal incremental benefit in an HDD crossing, and when considering that the overhead option was sufficiently buffered from other uses in this location, the underground option was initially considered not practicable. However, on October 19, 2018, CMP submitted amendments to its

[57] NRPA Application, Chapter 2.0, submitted to the USACE on September 29, 2017.

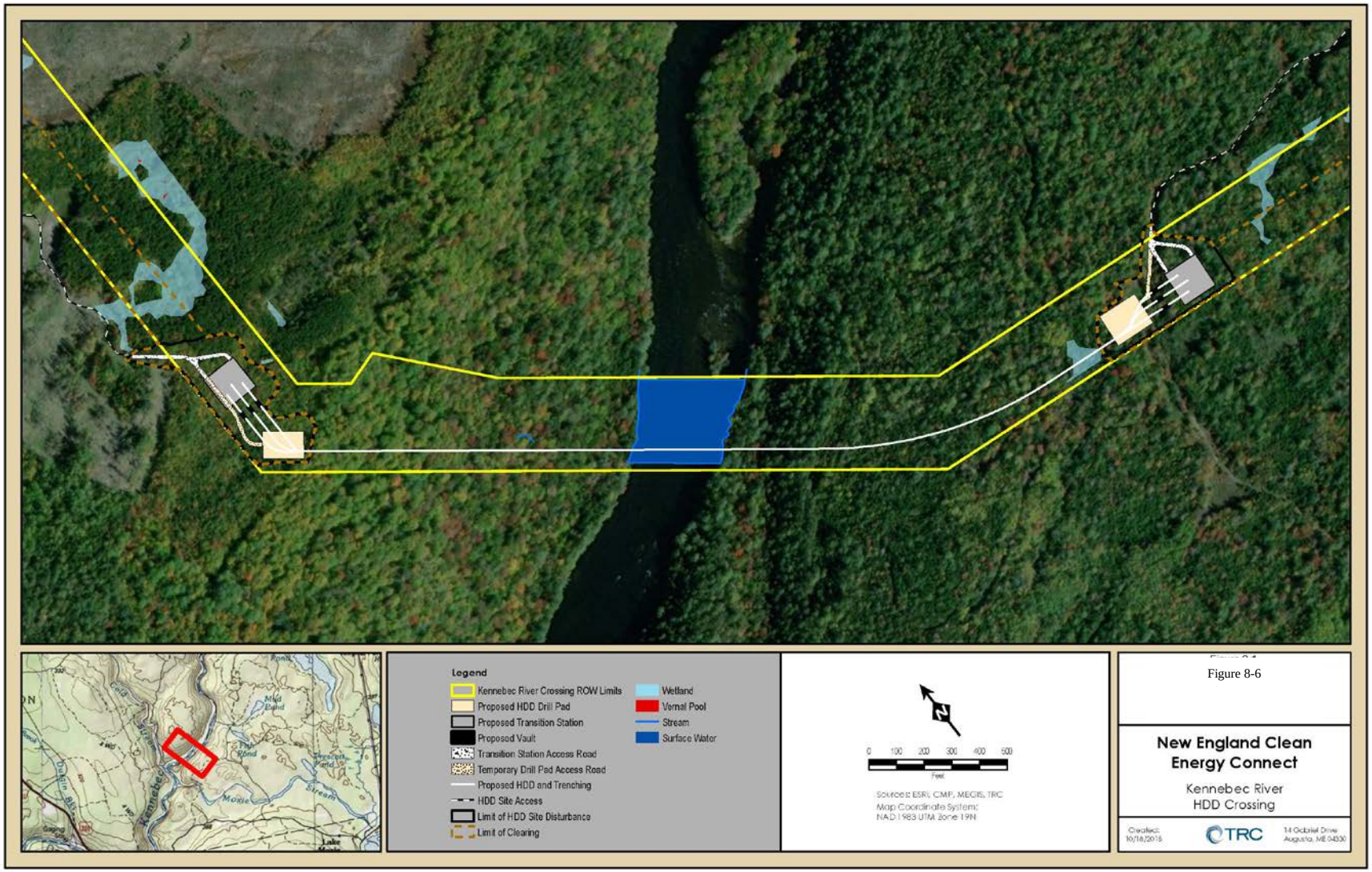
Applications[58] proposing to replace the overhead crossing of the Upper Kennebec River with an underground crossing alternative using HDD technology to eliminate visual impacts on recreational users of this Outstanding River Segment and the associated concerns of environmental regulators, the host communities, and other stakeholders.

Further analysis of construction feasibility, operational and maintenance considerations, total project cost, environmental impact, and visual and recreational impact of the Underground Transmission Alternative described in the September 29, 2017 Applications resulted in the conclusion that an HDD crossing beneath the Upper Kennebec River is preferred to an overhead crossing, because it would be less environmentally damaging than an overhead transmission line crossing.

The Project corridor crosses the Upper Kennebec River in West Forks Plantation and Moxie Gore. The transmission line within an HDD crossing would be entirely underground as it passes below the river. The termination stations that transition the transmission line from an underground to overhead configuration on each side of the river are in uplands and outside of protected natural resource areas (see Figure 8-6). The HDD installation and termination stations will not be visible from the Kennebec River and therefore visual impacts to recreational users will be avoided.

The positioning of the HDD entry and exit points will result in an expanded forested buffer on each side of the river as compared to the overhead crossing. Specifically, the forested buffer will expand from 300 feet long to 1,450 feet long on the east side of the river and 550 feet long to 1,160 feet long on the west side of the river. A biologically important DWA identified by the MDIFW, referred to as the Upper Kennebec DWA, encompasses both sides of the Upper Kennebec River. As a result, an HDD crossing is preferred to the overhead crossing because these expanded forested buffers will minimize impact to this DWA and provide important habitat connectivity for overwintering deer. As compared to the overhead crossing, the HDD crossing will also avoid impacts to wetlands (WET-49-01), resulting in a 9,384 square foot reduction of forested wetland conversion in this area.

[58] Site Location of Development Application Amendment for the Kennebec River Horizontal Drill, October 19, 2018; Natural Resources Protection Act Application Amendment for the Kennebec River Horizontal Directional Drill, October 19, 2019.


Legend
Kennebec River Crossing ROW Limits
Proposed HDD Drill Pad
Proposed Transition Station
Proposed Vault
Transition Station Access Road
Temporary Drill Pad Access Road
Proposed HDD and Trenching
HDD Site Access
Limit of HDD Site Disturbance
Limit of Clearing
Wetland
Vernal Pool
Stream
Surface Water
0 100 200 300 400 500
Feet
Sources: ESRI, CMP, MEGIS, TRC
Map Coordinate System:
NAD 1983 UTM Zone 19N
Figure 8-6
New England Clean Energy Connect
Kennebec River HDD Crossing
Created: 10/18/2018
TRC
14 Gabriel Drive Augusta, ME 04330

Based on this analysis, an overhead transmission line crossing of the upper Kennebec River is not preferred because it would have greater impacts than the HDD crossing. As described in the September 2017 Applications, overhead conductors would be visible to rafters passing through or stopping in this portion of the river, and views of the transmission line structures (for the five (5) structure option) would occur on the west side of the river with the overhead crossing. This will not occur with the HDD crossing.

The CMP Land Alternative and the Brookfield Alternative are not suitable or reasonably available for the reasons stated above. Accordingly, no practicable alternative to the HDD crossing exists which would be the LEDPA.

Appalachian Trail

Overhead Transmission Alternative

The NECEC Project crosses the P-RR subdistrict in two locations at the Appalachian Trail adjacent to Moxie Pond and Trestle Road in Bald Mountain Township in an existing CMP corridor containing a 115kV transmission line (Figure 8-7). The P-RR subdistrict in this location includes a 200-foot-wide strip centered over the Appalachian Trail. The configuration of the trail, within and adjacent to an approximately 3,500-foot long portion of transmission line corridor, prevented CMP from avoiding direct impacts to the subdistrict through the siting of the transmission line structures. As a result, two of five transmission line structures in this portion of the Project corridor are located within the P-RR subdistrict. Because the existing land use is transmission line corridor, there would be a negligible change in visual impact to hikers using the trail. Alternative alignments of the transmission line to meet the purpose and need of the Project would result in crossings of the Appalachian Trail in one or more locations where there are no existing transmission line corridors.

Underground Transmission Alternatives

Undergrounding is not practicable at the AT crossings within the P-RR subdistrict. An underground alternative would require construction of termination stations within sight of the trail, along with a trenchless crossing of the AT, approximately 3,500 feet long, at a cost of approximately $28.9 million, $28 million of which would be an incremental additional cost to the Project when subtracting associated overhead transmission line costs.[59] Furthermore, construction activities would last approximately 10 months and would require HDD rigs powered by an external diesel-powered hydraulic power plant that

[59] MDEP/LUPC Hearing: Bardwell Rebuttal at 17-18; Exhibit CMP-11-E.

would generate noise of approximately 110 decibels continuously while in operation.[60] Additionally, the easement allowing the AT in CMP's corridor includes provisions for additional overhead lines, but does not contemplate underground installations, so CMP would need to seek such rights from the NPS to allow underground installation.[61] Given the presence of the existing transmission line corridor, the very high cost of undergrounding in this location, and the fact that the underground alternative would have additional environmental and public impacts, undergrounding of the transmission line in the vicinity of the AT is not practicable.

Co-location of the transmission line within the existing transmission line corridor in an overhead configuration is therefore the LEDPA.

[60] MDEP/LUPC Hearing: Bardwell Rebuttal at 18.

[61] MDEP/LUPC Hearing: Bardwell Rebuttal at 18; Freye Rebuttal at 2-3; Hearing Day 6 Transcript at 396:10-19, 429:14-15 (Freye).

Figure 8-4: Appalachian Trail

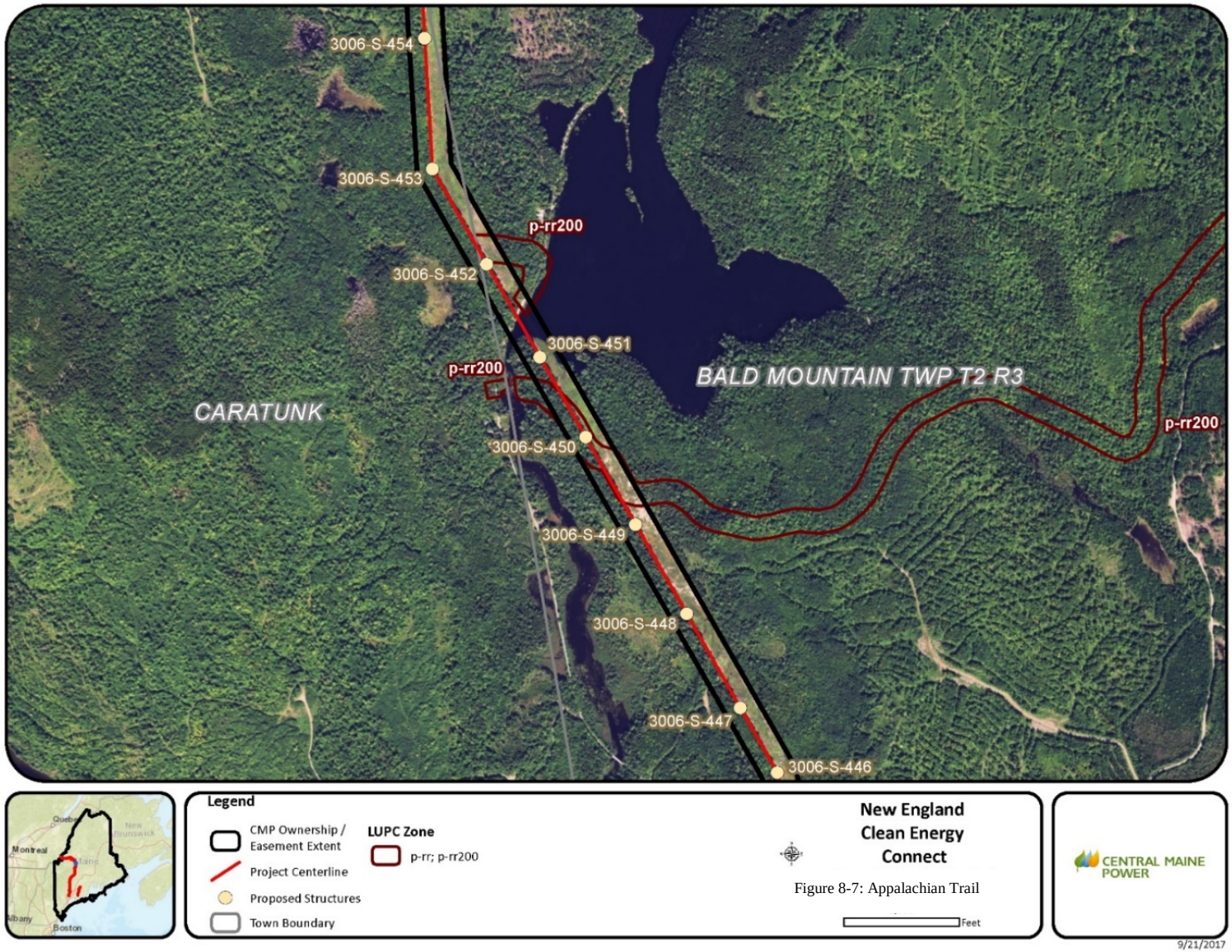


Figure 8-7: Appalachian Trail

8.3.3 Alternative Locations for Substations

8.3.3.1 Alternative Locations to Merrill Road Converter Station

Several sites for the DC to AC converter station were identified and evaluated based on availability, adequacy of land area suitable for the converter station siting, location along the preferred HVDC transmission route, proximity to the nearest substation capable of interconnection, and potential impacts to the environment and on surrounding land uses (see Figure 8-8).

CMP evaluated six sites (including the Larrabee Road Substation) as possible options for the converter station. The unimproved forested parcel owned by CMP, "CMP Parcel," on the south side of Merrill Road and a forested parcel, "Alternative 2 Parcel," were ruled out as not being large enough to accommodate the proposed facility. The Larrabee Road Substation was ruled out for this same reason. "Alternative Parcel 3," on the south side of Merrill Road, north of the Larrabee Road Substation, has sufficient land area, but the NRCS soil maps indicated ScA (Scantic silt loam, 0-3% slopes) and Pa (Peat and muck) soils throughout the lot. These soils are poorly drained or very poorly drained and therefore reflective of wetlands and are therefore not preferred from an environmental impact and an engineering standpoint.

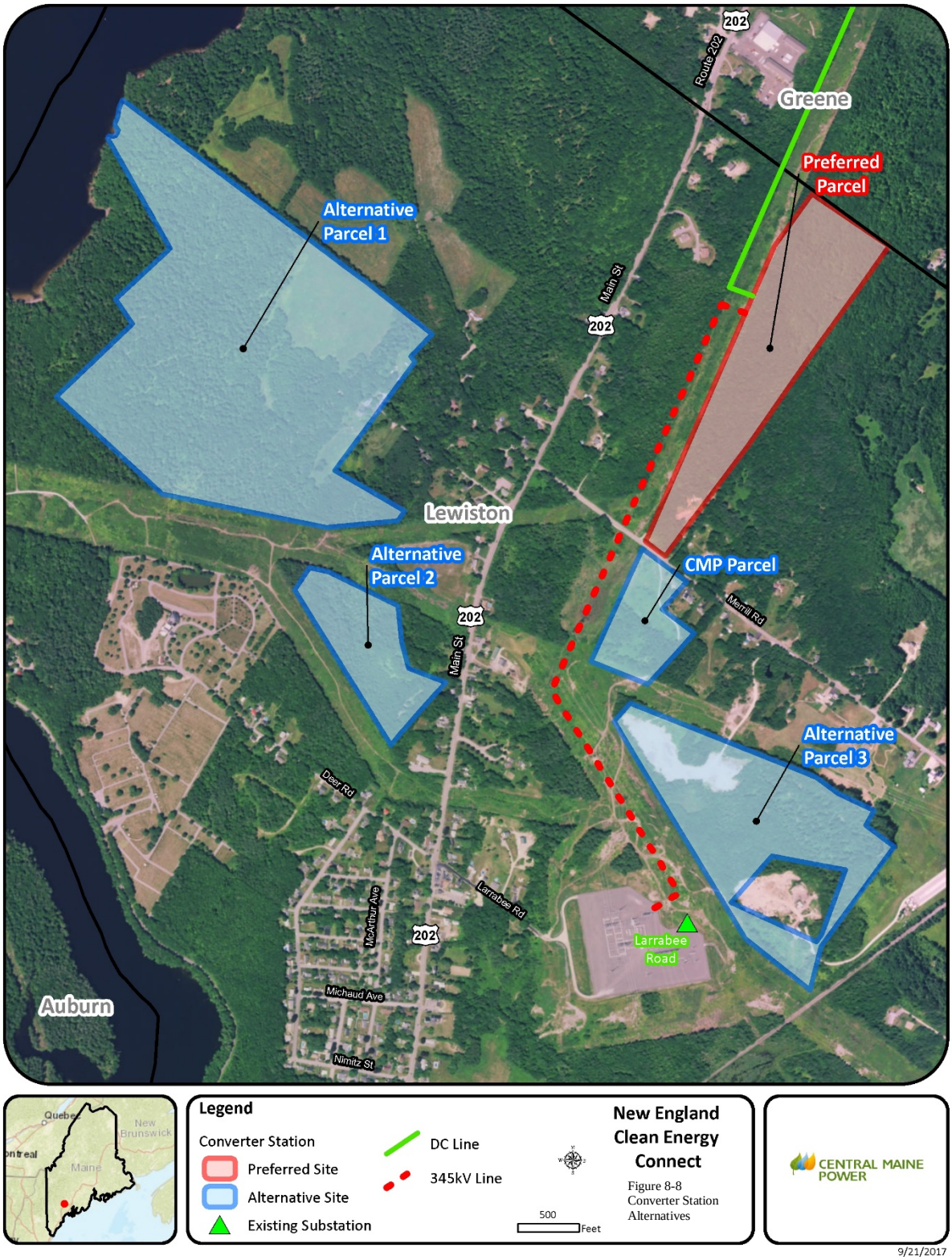
CMP identified two of the six properties as being most suitable: 1) the "Preferred Parcel" (the preferred site) located along the Project corridor 0.5 mile north of Merrill Road in Lewiston; and 2) the "Alternative Parcel 1" situated along an adjacent transmission corridor (0.6 mile from the Project corridor) located at the end of Taylor Hill Road in Lewiston. These two sites are approximately one mile from the Larrabee Road Substation in Lewiston. Both properties contain adequate land area, are located a suitable distance from residential structures, are bordered by significant vegetative buffers, and would allow for interconnection to the Larrabee Road Substation through existing ROWs. However, Alternative Parcel 1 would require the HVDC line to extend an additional 0.5 mile, including one HVDC line crossing of U.S. Route 202 and one crossing of U.S. Route 202 by the 345kV tie to the Larrabee Road Substation. Alternative Parcel 1 would also require an approximately one mile segment of transmission line Section 61 and Section 255 to be placed on double-circuited structures, which are not preferred for reliability reasons.

Both the preferred and alternative parcels contain wetlands, but based on existing natural resource data and NRCS soil survey maps, the location of wetlands on the Alternative Parcel 1 would not allow the converter station to be positioned immediately adjacent to the transmission line corridor without significant fill for both the converter station and the access road to the site. The preferred site is positioned directly along the Project's HVDC corridor. There is one mapped significant vernal pool

(SVP) on the preferred site, but the six-acre converter station will be sited in an upland area outside of the SVP depression. Clearing impacts will occur to the critical terrestrial habitat adjacent to this pool, but a significant amount of adjacent forestland will remain undeveloped in the immediate vicinity.

For these reasons, the alternative site on Alternative Parcel 2 is more environmentally damaging than the preferred Merrill Road Converter Station site on the Preferred Parcel and is therefore not practicable.

Figure 8-8: Merrill Road Converter Station Alternatives



8.3.3.2 Alternative Locations to the Fickett Road Substation

CMP Transmission Planning analyzed several locations across the CMP transmission system to identify the optimal location and size of the STATCOM units needed to maintain system voltage stability. The optimal design and location to ensure electrical performance and to maintain system voltage stability, and in order to minimize the size and number of the units required, was determined to be a 200 MVAR STATCOM located at Fickett Road in Pownal, adjacent to the existing Surowiec Substation, as well as a 200 MVAR STATCOM at the existing Coopers Mill Substation in Windsor.

The STATCOM at Coopers Mill Substation will be within the existing fence line; no alternatives were considered for this option as it meets the objective of avoiding or minimizing environmental impacts better than any potential alternative could.

The location of the STATCOM proposed at Fickett Road is electrically optimal, because it is located as close to Surowiec Substation (Pownal) as possible. The existing Surowiec Substation yard is not large enough to accommodate the new STATCOM, and site restrictions due to the location of Runaround Brook do not allow for expansion of the yard. The parcel located north of the Surowiec Substation, bordered by Fickett and Allen roads, is on existing CMP owned land, adjacent to an existing CMP transmission line corridor. The close proximity of the proposed substation to Surowiec Substation will minimize the length of overhead transmission line required to connect the two substation sites, thereby minimizing impacts compared to any alternative location farther from Surowiec Substation.

8.3.4 Site Specific Design to Minimize Environmental Impacts

As discussed in the preceding sections, CMP developed and comprehensively evaluated various hybrid alternatives and site-specific design alternatives to avoid impacts and, where unavoidable, minimize impacts to aquatic ecosystems and protected natural resources. CMP's alternatives analysis shows that the Preferred Alternative is the LEDPA. So too did CMP carefully site and design the Preferred Alternative to avoid and minimize potential natural resource impacts to the greatest extent practicable, resulting in site-specific adjustments to utility structure locations, temporary access roads, and substation designs.

Each segment of the NECEC route was assessed using GIS datasets available from the Maine Office of GIS, MDIFW, MNAP, and the NWI. These datasets included: rare, threatened, and endangered species; unique natural areas; significant wildlife habitat; wetlands designated in the NWI; public lands (e.g., state and local parks); and conservation land trust properties. Field surveys were completed during the 2015, 2016, 2017 and 2018 field seasons to identify new and verify previously mapped vernal pools, wetlands, and rivers and streams. Desktop reviews of prehistoric and historic archaeological sites and historic

architectural resources were conducted to locate potentially significant cultural resources. Visual analysis field surveys were conducted and photo simulations were created to study visual impacts. Findings of the field investigations specific to wetlands and other protected natural resources are discussed in Section 4.4.

After selecting the preferred NECEC route, CMP designed each transmission component to further avoid and minimize community, private property, and environmental impacts while maintaining a cost-effective and technically sound design in accordance with the 404(b)(1) Guidelines. These goals were achieved through two key design considerations. First, CMP attempted to site and design each NECEC transmission line segment within existing transmission corridors owned by CMP, although this was not practicable in all cases. Second, CMP established structure locations and temporary access roads that, to the extent practicable, avoided protected and sensitive natural and cultural resources.

In some instances, construction within areas of mapped protected or sensitive species occurrences or plant communities cannot be avoided due to topography or safety concerns associated with existing infrastructure. The proposed work, however, will not necessarily adversely impact the species or identified resource. In some instances, rare plant or natural communities are enhanced by, or result from, conditions created and maintained within transmission line corridors. Furthermore, the species, plant community, or habitat mapped in the general vicinity may not occur within the specific area of proposed construction, or may be absent at the time of construction, i.e., construction will be timed to minimize or avoid impacts to these to the greatest extent practicable. CMP has consulted with MNAP, MDIFW, and the USFWS regarding potential rare, threatened, and endangered plant communities and animal occurrences along the proposed transmission line corridors and will continue such consultations to ensure that potential effects on sensitive biological resources during and after construction are avoided and minimized to the maximum extent practicable.

Additional procedures that will also be utilized minimize environmental impacts during construction include implementation of CMP’s Environmental Guidelines, preconstruction wildlife surveys, selective time of year construction restrictions, and utilization of third-party inspectors and environmental inspectors during construction. CMP has also developed NECEC-specific plans for initial clearing and post-construction maintenance of vegetation within the Project ROW in its VCP and VMP.

9.0 COMPENSATION PLAN

9.1 Overview

CMP is pleased to provide a Compensation Plan ("Plan") which addresses a variety of natural resource impacts from the proposed construction and operation of the NECEC Project. This Plan achieves a *no-net-loss* of ecological functions and values through a combination of: use of the In-Lieu-Fee ("ILF") Program by the MDEP and USACE as a compensatory mitigation option for permit applicants; preservation of regionally significant natural resources; and implementation of a number of wildlife habitat enhancement projects. This Plan meets the compensation requirements of the MDEP, pursuant to the NRPA, 38 M.R.S. §480-A *et seq.*, and of the USACE pursuant to Section 404 of the CWA (33.U.S.C. §1344).

As described in Section 7.0, CMP first sought to avoid and then minimize impacts wherever practicable through a thorough alternatives analysis and engineering design. However, where impacts cannot be avoided, a number of mitigation measures will be employed prior to and during construction to minimize impacts. These include measures such as: erosion and sedimentation controls, the use of equipment mats, consultation with third-party inspectors, construction timing restrictions, installation of avian avoidance markers where applicable, and winter condition clearing and construction, where practicable. Areas of temporary impact will be restored and revegetated as per the restoration measures described in CMP's Environmental Guidelines.

In this Plan, CMP will compensate for temporary and indirect natural resource impacts (i.e., impacts not directly associated with the placement of fill, such as conversion of habitat or tree clearing) and permanent alteration of protected natural resources. All temporary impacts will be of short duration, i.e., less than 18 months, and typically much shorter than 18 months. Permanent impacts requiring compensation are limited to either cover type conversion of protected natural resources or placement of fill resulting in loss of protected natural resource area.

CMP developed this compensation plan with input and participation from the MDEP and USACE. CMP held a working session with both agencies in April 2018, with the goal to define those compensable impacts and determine the compensation rates or ratios each agency would require. While each agency's requirements differed slightly, CMP's has developed a comprehensive compensation package that satisfies the requirements of both the MDEP and USACE. In the NRPA Application, CMP proposed to offset unavoidable impacts to natural resources, which are not fully addressed through CMP's avoidance and mitigation measures, through a contribution to the MDEP ILF Program. While USACE specified that

full compensation via ILF was acceptable, the MDEP indicated that ILF cannot be used as the sole source of compensation for the Project. The MDEP requires a compensation package that consists of a combination of preservation, enhancement, and/or ILF to offset the variety of project impacts including those impacts that are outside the purview of the ILF Program (38 M.R.S § 480-Z, e.g. indirect impact to rivers, streams or brooks, indirect impact to local and/or regional recreational values and outstanding river segments and wildlife habitat). The Compensation Plan set forth here is robust, fully accounts for and, in fact, provides more than the required compensation amounts for unavoidable Project impacts.

In consultation with MDEP and USACE, CMP defined the protected natural resource impacts that will result from construction of the NECEC and which will be addressed in the Compensation Plan. Additionally, the compensation ratios at which CMP must offset those impacts were determined by working directly with MDEP and USACE. Those rates can be found in Exhibit 9-1, NECEC Mitigation Guidance: Compensation Ratios and Adjustments per Agency.

CMP's Compensation Plan addresses the following unavoidable impacts:

- Temporary Wetland Fill
- Permanent Cover Type Conversion of Forested Wetlands
- Permanent Cover Type Conversion of Inland Waterfowl and Wading Bird Habitat (IWWH)
- Permanent Cover Type in Significant Vernal Pool Habitat (SVPH)
- Permanent Cover Type Conversion of Deer Wintering Ares (DWAs)
- Permanent Fill in IWWH
- Permanent Fill in SVPH
- Direct and Secondary Impact to USACE Jurisdictional Vernal Pools
- Other Impacts:
    - Impacts to recreational uses of outstanding river segments
    - Indirect impacts to coldwater fisheries
    - Impacts to wildlife habitat, including rare species
    - Impacts to rare plants and unique natural communities

9.2 NECEC Compensation Components

9.2.1 Compensation Summary

The NRPA Wetlands and Waterbodies Protection Rules provide that "compensation is the offsetting of a lost wetland function with a function of equal or greater value," and sets as a goal "no-net loss of wetland functions and values" (NRPA Wetlands and Waterbodies Protection Rules, Chapter 310 § 5C). This goal

supports the federal goal of *no net loss* stated in a February 6, 1990 MOA between USEPA and USACE titled *The Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines.*

Compensation amounts, or ratios of compensation to impact, are established by the Wetlands and Waterbodies Protection Rules, Chapter 310, and the Significant Wildlife Habitat Rules, Chapter 335. For example, compensation by restoration, enhancement, or creation is to be at least at a ratio of 1:1 for wetlands that are not of special significance and 2:1 for impacts to Wetlands of Special Significance ("WOSS"; (Chapter 310 §4). The ratio is set at 8:1 for preservation, which can include adjacent upland areas (Chapter 310 § 5C5(a-c). For those impacts offset through the ILF Program, resource compensation fees are calculated using resource-specific formulas, resource compensation rates and resource multipliers, as provided in the DEP Fact Sheet – In Lieu Fee Compensation Program (2017) ("ILF Program"). Resource multipliers take into consideration the significance of specific resources.

Compensation ratios established by the USACE's 2016 New England District Compensatory Mitigation Guidance ("Mitigation Guidance") are based on complexity of the wetland system, likelihood of compensation success, degree to which functions are replaced, and temporal losses for certain functions. The USACE has developed standard compensatory mitigation ratios (multipliers), provided as guidance allowing for "flexibility," and suggested multipliers, which are a starting point for developing a compensation plan. The guidance also suggests that while the ILF Program is "considered preferable," preservation as mitigation can support the goal of "no net loss of wetland functions." Preservation parcels used for mitigation must meet certain criteria to be considered for this purpose (33 CFR 332.3(h)). The USACE generally follows the MDEP's ILF Program resource compensation rates and resource multipliers.

Both agencies recognize that, for some resources, the temporary or secondary impact associated with transmission line construction and long-term operation does not equate to a full loss of resource functions and values, and therefore allows for adjustments to the standard ratios and multipliers depending upon the resource and activity type. The USACE defines these adjustments, as a percentage of the standard amount by resource type, within Table C2 Recommended Compensatory Mitigation for Temporary and/or Secondary Impacts to Wetlands of the 2016 Mitigation Guidance. The MDEP provided correspondence to CMP dated April 25, 2017, in which Michael Mullin, former Director of Land Division, Bureau of Land Resources, allowed for a compensation adjustment of 60% for permanent cover type conversion impacts within significant vernal pool habitat, as defined by 38 M.R.S. § 480-B(10). CMP interpreted this adjustment to apply to all significant wildlife habitat and as such is applying a 60% adjustment to permanent cover type conversion impacts within IWWH. CMP confirmed with the MDEP, during a

compensation plan working session with the MDEP and USACE on April 3, 2018, that application of the 60% adjustment for cover type conversion impacts in IWWH was appropriate. *See* Exhibit 9-1, NECEC Mitigation Guidance: Compensation Ratios and Adjustments Per Agency; Exhibit 9-2 MDEP Letter Re: Compensation for significant vernal pool habitats within transmission line corridors (Apr.25, 2017).

Compensation planning for the NECEC included a review of existing and potential compensation tracts already in CMP's ownership. CMP looked for compensation opportunities based on the criteria set forth in the USACE's Mitigation Rule, 33 CFR 332.3(h). Properties which were not considered as part of this final plan did not provide sufficient ecological or regional value to merit preservation. After a comprehensive GIS evaluation, the most viable tracts were field surveyed for the presence of natural resources. CMP considers the compensation parcels presented in this Plan as eligible for this use, as demonstrated in Section 9.2.2.2 and within the letter report from the Musson Group dated August 10, 2018 (see Exhibit 9-3), which evaluated the preservation parcels for purposes of meeting the USACE mitigation requirements, including but not limited to the provision requiring that the applicant demonstrate that preservation areas are under threat of destruction or adverse modification.

For impacts that require compensation from both the MDEP and USACE, CMP used the higher USACE ratios in determining required compensation amounts. For resource impacts for which only one agency required compensation, NRPA or USACE guidance was followed. The Compensation Package Summary, Exhibit 9-4, details the preservation parcels and the Project impacts they are proposed to offset. The In-Lieu Fee Summary, Exhibit 9-5A, presents the calculated fees by resource type with the standard formulas, and appropriate multipliers and adjustments. Table 9-1 below summarizes the results of those Exhibits. Exhibit 9-5B, Summary of Compensation Resulting from Consultation with Resource Agencies, presents the results of consultation with MDEP, MDIFW, and MNAP to provide adequate compensation for resources which require compensation but are outside the purview of the MDEP and/or USACE mitigation guidance. Table 9-2 below summarizes the results of this exhibit.

Table 9-1: Summary of Compensation as Required by NRPA and/or USACE

Resource Type & Impact	Agency Requiring	Form of Compensation	Type and Amount of Compensation
47.687 acres of Temporary Wetland Fill	USACE	Preservation and In-Lieu Fee	Preservation of 57.01 acres of wetlands. $154,535.04
105.548 acres of Permanent Cover Type Conversion of Forested Wetlands[1]	USACE and MDEP	Preservation	Preservation of 440.29 acres of wetlands.
3.814 acres of Permanent Fill in Wetlands of Special Significance (WOSS)[2]			
0.307 acres of Permanent Fill in Wetland (Non-WOSS)			
0.743 acres of Permanent Wetland Fill in SVP Habitat	MDEP	In-Lieu Fee	$641,653.12
3.895 acres of Permanent Forested Wetland Conversion in SVPH			
0.720 acres of Permanent Upland Fill in SVP Habitat			
29.607 acres of Permanent Upland Conversion in SVPH			
Direct and Indirect Impact to USACE Jurisdictional Vernal Pools	USACE	In-Lieu Fee	$2,024,875.37
0.003 acres of Permanent Wetland Fill in IWWH	MDEP	In-Lieu Fee	$253,352.53
2.622 acres of Permanent Forested Wetland Conversion in IWWH			
0.014 acres of Permanent Upland Fill in IWWH			
12.387 acres of Permanent Upland Conversion in IWWH			
	In-Lieu Fee		$3,074,416.06
	Land Preservation		1022.4 acres of preservation containing 510.75 acres of wetland.

[1]The USACE requires compensation for Permanent Cover Type Conversion of Forested Wetlands. The MDEP requires compensation for Permanent Cover Type Conversion of significant wildlife habitat. Compensation for wetlands within significant wildlife habitat, IWWH and SVPH, are not included within the Permanent Cover Type Conversion of Forested Wetlands calculation and are calculated separately within their respective categories. Cover type conversion within upland areas of IWWH and SVPH are compensated separately as well.
[2]Permanent fill in WOSS excludes fill in IWWH and SVPH, which are calculated separately, in their respective categories.

Table 9-2: Summary of Compensation Resulting from Consultation with Resource Agencies

Resource Type & Impact	Agency Requiring	Form of Compensation	Amount of Compensation
9.229 acres of forested conversion in Unique Natural Communities	MNAP	Fee Contribution to Maine Natural Areas Conservation Fund	$1,224,526.82
Forested conversion to the Goldie's Wood Fern	MNAP	Funding for rare plant surveys to the Maine Natural Areas Conservation Fund	$10,000
26.416 acres of forest conversion in Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas	MDIFW	Fee Contribution to Maine Endangered and Nongame Wildlife Fund	$469,771.95
39.209 acres of forest conversion in the Upper Kennebec Deer Wintering Area	MDIFW	Preservation	Seven parcels, totaling 717 acres of land in the Upper Kennebec DWA
11.02 linear miles of forested conversion in riparian buffers	MDEP and MDIFW	Preservation	Three preservation parcels, totaling 1053.5 acres, containing 12.02 linear miles of stream
		Fee contribution to Maine Endangered and Nongame Wildlife Fund	$180,000
		Funding for Culvert Replacements	$200,000
Impact to Outstanding River Segments	MDEP	Preservation	Three preservation parcels, offering 7.9 miles of frontage on the Dead River, an Outstanding River Segment
	Total Additional Monetary Contribution		**$2,084,298.76**
	Total Additional Land Preservation		**1770.5 Acres**

9.2.1.1 Temporary Wetland Fill

Temporary wetland fill impacts are primarily associated with the construction of short term access ways required for clearing and construction activities. Temporary fill associated with access way construction was conservatively calculated assuming non-frozen ground conditions. As a result, temporary fill or the use of protective matting (e.g. timber mats) for heavy equipment set up and travel was included in the calculation for access ways and structure preparation areas in all wetlands. Access ways have been designed to avoid, and when avoidance is not possible, to minimize disturbance to protected natural resources to the greatest extent practicable. For example, wetlands and streams will be crossed at their narrowest point if other conditions and construction access requirements allow this. Access ways will be removed as soon as it is safe and feasible to do so and when access ways are no longer needed for the Project. Fill needed for temporary access ways will not cause a net loss in wetland acreage or functionality. These small, scattered impacts will have a de minimis effect on the overall functions and values in the areas in which they occur, and there will be no permanent loss of wetland functions and values or wetland area. Temporary wetland fill will be in place significantly less than 18 months, and typically for a period of 12 months.

Compensation for temporary wetland fill, in place less than 18 months, is only required by the USACE, and is not required by MDEP. CMP has elected to offset impact for temporary fill in wetlands using a combination of land preservation and ILF. Three compensation parcels -- Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract, further detailed in Section 9.2.2.2 -- contain 510.75 acres of wetland to offset impacts to temporary wetland fill in scrub-shrub wetlands, as well as other wetland impact types, at the required ratios and adjustments. For scrub-shrub wetlands, the ratio for preservation is 20:1 with an adjustment of 10%, as set forth in the USACE Mitigation Guidance. An adjustment developed by the USACE for temporary and secondary impacts is applied to temporary impacts to emergent wetlands (5%) and temporary impacts to scrub-shrub wetlands (10%).

The ILF is used to compensate for temporary wetland fill in emergent wetlands. For the purposes of determining the appropriate ILF, the USACE follows the guidance defined in the MDEP Fact Sheet-In Lieu Fee Compensation Program (rev. 8/18/2017). The compensation fee for temporary fill to emergent wetlands was calculated using the resource-specific formula with a resource multiplier of one and an adjustment of 5%.

There are approximately 19.180 acres of temporary wetland fill impact to emergent wetlands. A payment of $154,535.04 will be contributed to the ILF Program to offset Temporary Wetland Fill Impacts to emergent wetlands.

There are approximately 28.507 acres of temporary wetland fill impact to scrub-shrub wetlands. For temporary wetland fill to scrub-shrub wetlands, the USACE's standard of 20:1 with a ratio adjustment of 10% was used to calculate the total required preservation amount of 57.01 acres. The three proposed compensation parcels -- Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract -- contain 510.75 acres of wetland, a portion of which will be used to offset the 57.01 acres of Temporary Wetland Fill in scrub-shrub wetlands.

9.2.1.2 Permanent Cover Type Conversion of Forested Wetlands

The majority (73%) of the NECEC Project will be located within or immediately adjacent to existing transmission line corridors. Clearing of tree species capable of growing into the conductors (referred to as "capable species") will be required to expand, typically by 75 feet, the width of the portion of the corridor where the Project will be co-located with existing transmission lines, and to create the 150-foot wide section of the new corridor located between The Forks Plantation. and Beattie Township. Tree removal from wetlands does not result in a net loss of any wetland area, and only potentially shifts or alters, but does not reduce, certain wetland functions and values. This type of cover type alteration, i.e., conversion of forested wetlands to early successional cover type wetlands, will result in the largest cumulative wetland alteration.

Compensation for forested wetland conversion is not required by the MDEP but is required by the USACE. The MDEP requires compensation for permanent cover type conversion of significant wildlife habitat. Compensation for wetlands within significant wildlife habitat, i.e. IWWH and SVPH, are not included within the Permanent Cover Type Conversion of Forested Wetlands calculation and are calculated and compensated for separately within their respective categories.

Conversion of forested wetlands to scrub-shrub wetlands accounts for approximately 105.548 acres. Even though there is no-net-loss of wetland functions or acreage resulting from clearing of forested wetland CMP will offset conversion of this habitat with the permanent preservation of lands which provide comparable habitat. For forested wetland conversion, the USACE's standard of 20:1 with a ratio adjustment of 15% was used to calculate the total required preservation amount of 316.64 acres.

The three proposed preservation parcels -- Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract -- contain 510.75 acres of wetland, a portion of which will be used to offset the 105.548 acres of Permanent Forested Wetland Conversion.

9.2.1.3 Permanent Cover Type Conversion of IWWH

High quality IWWHs are typically composed of deep emergent marshes with high levels of interspersion of shrubs, open water, emergent wetland vegetation, and floating leaf, aquatic plants. As such, these habitats are typically not heavily forested and can be crossed by transmission line corridors without being significantly or adversely affected.

There will be approximately 15.009 acres of permanent cover type conversion in moderate and high value IWWH. Of the 15.009 acres, 2.622 consist of forested wetland and 12.387 acres are upland areas. Compensation for cover type conversion of upland areas of IWWH is only required by the MDEP, and not the USACE; compensation for wetland areas of IWWH is required by both agencies. Clearing and construction in IWWHs will take place in accordance with the time of year restrictions for work within IWWHs, as described in Section 7 of the Site Law Application. CMP will compensate for unavoidable impact to IWWH through a payment to the ILF Program. The compensation fee for cover type conversion within wetland areas of IWWH was calculated using the Natural Resource Enhancement & Restoration Cost and the average assessed land value per square foot of impact. For upland areas of IWWH, the fee was calculated using the average assessed land value per square foot of impact. During the April 3, 2018 compensation working session, MDEP (Jim Beyer) indicated that impacts to upland areas within Significant Wildlife Habitat (e.g. IWWH and SVPH) do not require a Natural Resource Enhancement & Restoration Cost factor, which is intended for the restoration of wetland areas. Mr. Beyer also indicated that a 60% adjustment would apply to IWWH. This is consistent with compensation for other significant wildlife habitat areas where the adjusted ILF has been determined to be sufficient to offset the partial loss of functions and values resulting from cover type conversion only, which (like SVPH conversion) has less of an environmental impact. The basis of a 60% adjustment is further supported by the acknowledgement in Chapter 305 of the MDEP Rules that certain activities *"will not significantly affect the environment and generally has less of an impact on the environment than an activity requiring an individual permit"*. One such activity allowed by Chapter 305 is the cutting or removal of vegetation within high or moderate value inland waterfowl and wading bird habitat ("IWWH"), or shorebird feeding or roosting buffer. As such, an adjustment of 60% to the standard calculation for ILF payment was applied. A payment of $252,130.55 will be contributed to the ILF Program to offset Permanent Cover Type Conversion within IWWH.

9.2.1.4 Permanent Cover Type Conversion of Significant Vernal Pool Habitat

The NECEC Project contains approximately 62 vernal pools which meet the definition of significant vernal pool under the Maine NRPA Chapter 335 significant vernal pool habitat identification criteria (DEP Reg 335.9B). The vernal pool habitat (also referred to as "vernal pool critical terrestrial habitat") includes the pool basin or depression plus a 250-foot buffer around the pool. Within the NECEC Project, permanent conversion from forested to non-forested cover in significant vernal pool habitats totals approximately 33.502 acres. Of the 33.502 acres, 3.895 are forested wetland and 29.607 acres are upland areas.

CMP will compensate for this unavoidable impact through a payment to the ILF Program. The compensation fee for cover type conversion within wetland portions of SVPH was calculated using the Natural Resource Enhancement & Restoration Cost and the average assessed land value per square foot of impact. For upland areas of SVPH, the fee was calculated using the average assessed land value per square foot of impact. An adjustment of 60% to the standard calculation for ILF payment, as prescribed by MDEP, was applied. A payment of $391,689.22 will be contributed to the ILF Program to offset Permanent Cover Type Conversion within SVPH.

9.2.1.5 Permanent Fill in Wetlands

There will be permanent fill impact from structures placed in wetlands. Fill will result from structures, soil mounding associated with pole placement, and, where necessary, concrete foundations. The area of disturbance for each pole varies based on structure type. Installations will range from approximately 30 to 185 square feet of permanent fill per structure, depending on structure type (e.g., steel monopole or wood H-frame). Following installation, the areas around each structure will naturally revegetate to herbaceous or shrub wetland communities. The small loss of wetland area from the structure fill equates to a negligible loss of wetlands functions and values relative to the remaining wetland area at each structure site. Taken individually, impacts from structures will have a negligible permanent impact on their particular installation locations.

The Merrill Road Converter Station, Fickett Road Substation and HDD Terminations Stations will have permanent wetland impacts from fill of approximately 3.130 acres, 1.328 acres and 0.259 acres, respectively. Permanent fill impact from transmission line structures total approximately 0.150 acre. CMP will provide compensation for the cumulative permanent wetland impacts associated with structure installation and substation site development, which total approximately 4.867 acres, including wetland areas in SVPH and IWWH.

Wetlands within NECEC segments and substations were classified as either wetlands that are not of special significance or as WOSS, as defined in DEP Reg. Chapter 310.4. Habitats reviewed to determine freshwater WOSS include:

- mapped habitats for state and federally listed T&E species;
- high and moderate value IWWH;
- presence of significant vernal pool habitat;
- areas within 250 feet of a great pond;
- wetland containing more than 20,000 square feet of open water or aquatic or emergent marsh;
- located within a flood plain;
- designated as a peatland; or
- located within 25 feet of a river stream or brook.

Of the 4.868 acres of permanent wetland fill, fill in Non-WOSS and WOSS wetlands totals 0.307 acres and 4.561 acre, respectively. The 4.561 acres of direct fill in WOSS, include wetland areas in SVPH and IWWH. CMP will offset permanent fill within wetlands with the preservation of lands that provide comparable habitat. For wetlands within SVPH and IWWH, CMP will offset permanent fill using the ILF. Permanent fill in WOSS, excluding SVPH and IWWH, is 3.814 acres.

CMP offered to USACE a ratio of 30:1 for permanent fill in wetlands, which is above the 20:1 required for land preservation of the compensation parcels offered as part of this plan. When applying 30:1 to both WOSS (excluding SVPH and IWWH) and non-WOSS, it yielded a total required preservation amount of 123.65 acres. The three proposed preservation parcels -- Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract -- contain 510.75 acres of wetland, a portion of which will be used to offset the 4.122 acres[62] of Permanent Fill in Wetlands.

9.2.1.6 Permanent Fill in IWWH

Where unavoidable, direct impact to IWWH will result from the placement of transmission line structures. Direct impacts to IWWH total approximately 0.017 acre (747 square feet). Of the 0.017 acre, 0.003 acre (149 square feet) are wetland and 0.014 acre (598 square feet) are upland areas.

[62] The 4.122 acres of permanent fill in wetlands include 0.307 acre of non-WOSS and 3.814 acres of WOSS, excluding wetland areas within SVPH and IWWH, which are compensated through ILF.

CMP will compensate for this unavoidable impact through a payment to the ILF Program. Permanent fill in wetland areas located within IWWH requires 100% compensation with a resource multiplier of two. The fee for wetlands within IWWH was calculated using the Natural Resource Enhancement & Restoration Cost and the average assessed land value per square foot of impact. For upland areas of IWWH, the fee was calculated using the average assessed land value per square foot of impact. A payment of $1,221.98 will be contributed to the ILF Program to offset Permanent Fill in IWWH.

9.2.1.7 Permanent Fill in Significant Vernal Pool Habitat

Permanent fill in SVP habitat will result from pole placement in both wetlands and uplands located within the 250 foot critical terrestrial habitat located around the pool depression, as well as from site development associated with the Merrill Road Converter Station. Potentially significant vernal pools that have not yet been determined as "significant" by MDIFW will be included in this calculation. There will be no direct impact to any significant vernal pool depressions.

Direct impacts to SVPH total approximately 1.463 acres. Of the 1.463 acres, 0.743 acre are wetland and 0.720 acre are upland areas. CMP will compensate for this unavoidable impact through a payment to the ILF Program. Permanent fill in wetland areas located within SVP critical terrestrial habitat requires 100% compensation with a resource multiplier of two. The fee for SVPH wetlands was calculated using the Natural Resource Enhancement & Restoration Cost and the average assessed land value per square foot of impact. For upland areas of SVPH, the fee was calculated using the average assessed land value per square foot of impact. A payment of $249,963.90 will be contributed to the ILF Program to offset permanent fill in significant vernal pool habitat.

9.2.1.8 Direct and Indirect Impacts to USACE Jurisdictional Vernal Pools

Under the provisions of Section 404 of the CWA, the USACE regulates activities in "waters of the United States," which include vernal pools. Vernal pools are defined by the New England District of the USACE in the General Permit ("GP") for the State of Maine reissued on October 13, 2015. The USACE definition, while very similar to the MDEP's, does not reference "natural" and does not recognize or differentiate significant vernal pools based on number of indicator species egg masses. Instead, the GP definition indicates: "the presence of any of the following species in any life stage in any abundance level/quantity would designate the waterbody as a vernal pool: fairy shrimp, blue spotted salamanders, spotted salamanders or wood frogs. The USACE may determine during a Category 2 Review that a waterbody should not be regulated as a vernal pool based on available evidence." Furthermore, under the Maine GP the USACE regulates activities within a distance of 750 feet from vernal pool depression, also

referred to as the "vernal pool management area," which includes the pool depression, the envelope (area within 0 to100 feet of the vernal pool depression edge), and the critical terrestrial habitat (area within 100 to 750 feet of the vernal pool depressions edge).

In September 2016, the USACE New England District issued its updated Mitigation Guidance document. Within this document, the USACE provides the following guidance: "to determine the appropriate mitigation for vernal pool impacts, the pools to be impacted must be evaluated using the USACE Vernal Pool Characterization Form. This form documents both the quality of the vernal pool and its surrounding landscape to determine overall level of function of the pool." This "DRAFT Vernal Pool Characterization Form (9-7-16)," included within the guidance, is designed to characterize vernal pools and provide a valuation based on a point system for features of the pool and surrounding habitat for regulatory purposes, impact and compensatory mitigation assessment. The pools are scored or valued based on vernal pool characteristics, vernal pool envelope (100 ft) and critical terrestrial habitat area (100-750 ft) characteristics, and species present within the pool. Pools are then classified as having high, medium or low levels of functions, as determined by the scoring system on the form.

When the 2016 USACE Mitigation Guidance was issued, the NECEC natural resources survey effort was well underway. As such, CMP's consultants recorded field observations and pool characteristic data on the MDEP's Maine State Vernal Pool Assessment forms (DEPLW0897-82008) if the pool was potentially significant as defined in NRPA. For those pools which were not potentially significant as defined in NRPA, but were USACE-jurisdictional, data was collected on a consultant-created form that documented the survey efforts, which were conducted in accordance with a long-standing, broadly vetted, rigorous methodology accepted by the regulatory agencies. Nonetheless, the form did not utilize the scoring or classification contained in the 2016 guidance.

To evaluate the pools based upon the classification of high, medium, or low, and to provide the appropriate level of compensation for each resource, CMP proposed evaluation criteria based on the existing level of information collected using the 2016 guidance as a framework. CMP worked with the USACE to determine the evaluation methods and received feedback on its proposal. *See* Exhibit 9-6.

Following the examination of all vernal pool features within the Project area, CMP determined that 49 high value pools, 122 medium value pools, and 71 low value pools will be impacted by the Project and will require compensation.

The 2016 Guidance defines the amount of mitigation credit necessary to compensate for vernal pool impacts. The USACE uses the following ratio pattern for determining amount of preservation necessary to offset project impacts:

- For the loss of a low value pool, one medium or high value pool and its associated critical terrestrial habitat ("CTH") should be preserved.
- For the loss of one medium value pool, three pools of medium or high value and its associated CTH should be preserved.
- For the loss of one high value pool, five pools of medium or high value and its associated CTH should be preserved.

For calculating ILF, the applicant is to provide an ILF for direct fill to the pool depression or 100-foot envelope at the regular wetland rate and, in addition, the same ratio pattern is applied using a standard of 13,000 square feet for each vernal pool habitat, regardless of pool size. For example, the applicant will pay the equivalent of 13,000 square feet for a low value pool to protect one vernal pool and CTH, plus any direct fill impacts to the depression or envelope. Similarly, for medium value pools this value would be multiplied by three, 13,000 x 3 = 39,000 square feet; for a high value pool this value would be multiplied by five, 13,000 x 5 = 65,000 square feet.

Thus, for direct fill of USACE-jurisdictional vernal pools, CMP calculated the payment at the regular wetland rate. For secondary impacts as defined in the 2016 Guidance, which do not cause loss of the resource,[63] CMP applied a 5% adjustment[64] to the standard amount, which for vernal pools is set forth on page 95 of the 2016 Guidance (based on the value of the vernal pool). CMP determined the percent of this adjustment based on Table C2 (page 58), which provides suggested multipliers for secondary impacts to wetlands; that table applies here because the 2016 Guidance does not include anything more specific for vernal pools. These multipliers are percentages of "Standard Amount," where "Standard" refers to "amount of compensation that would be required in ILF payments using the standard calculation" (on page 95 for vernal pools).

[63] The Guidance treats conversion of forest cover as a secondary impact, specifically for utility transmission lines. See page 15, referring to "the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way." See also page 91, stating that "In instances where there are primary impacts to aquatic resources, additional impacts to the canopy cover may be considered secondary impacts to the vernal pool and should be documented."

[64] On page 15 the 2016 Guidance states that "Suggestions for mitigation for . . . secondary impacts are expressed as percentages or ranges of percentages of the mitigation recommended for direct, permanent impacts."

The applicable category in Table C2 is "Removal of forested wetland cover for new corridor," which states that the multiplier is "Project specific," and states in a footnote that "This should also take into account fragmentation impacts as part of the secondary impacts." Further, "Percentages may be reduced if appropriate project-specific BMPs are incorporated into the Project." The most closely analogous percentage is 15%, which applies to "Permanent conversion of forested wetlands to scrub-shrub wetlands."

The 2016 Guidance further provides that compensatory mitigation may not be needed at all, or may be reduced below the stated percentages, if the considerations on pp. 15-16 support such a reduction. For vernal pools, the key consideration is "Vernal pool envelope and critical terrestrial habitat impacts: original aerial cover, relationship to other vernal pools, etc."

Regarding original aerial cover, based on aerial photographs the existing average forested cover within the 750 foot CTH of NECEC Project USACE-jurisdictional vernal pools is 73.6%. The NECEC Project would reduce this average forested cover to 68.9%, a reduction of forested cover of 4.7% within the CTH of USACE-jurisdictional vernal pools.

Regarding relationship to other vernal pools, 610 of the 700 USACE-jurisdictional vernal pools identified in the NECEC Project corridor are within 1,000 feet or less of other vernal pools and are thus cluster pools. The 2016 Guidance documents the value of cluster pools and notes, in part, "Clusters of vernal pools that vary in size, hydroperiod, and spatial proximity, provide each resident species with a variety of potential breeding sites. This allows adults to seek out high quality habitat with low densities of predators, provides a safety net in the event that one or more pools become uninhabitable due to disease, and increases the potential for genetic diversity" (see page 93 of the 2016 Guidance).

Based on the above provisions and considerations, CMP applied a 5% adjustment to the standard amounts set forth for vernal pools on page 95 of the 2016 Guidance.

The 2016 Guidance recognizes the need for flexibility in determining reasonable compensatory mitigation in circumstances such as this. For vernal pool resources, the 2016 Guidance briefly mentions "secondary impacts to the vernal pool due to loss or disturbance of the envelope and/or critical habitat," and references the Vernal Pool Characterization Form as the basis for determining compensatory mitigation. However, this form can only be completed for a given vernal pool in its current state; estimating pool functions post-development is therefore speculative and unreliable as a method to forecast shifts in functions and values due to indirect impacts such as conversion of vernal pool CTH from forested to scrub-shrub.

CMP worked with the USACE to develop and employ project-specific criteria for the valuation of USACE-jurisdictional vernal pools. Specifically, CMP proposed vernal pool value evaluation criteria based on the available information collected during 2015-2017 field surveys and using the principles of the 2016 Guidance as a framework. CMP worked with the USACE to develop this evaluation method and received feedback from USACE on its proposal. CMP utilized these criteria to classify NECEC vernal pools as high, medium, or low value.

CMP then developed and proposed a significant, reasonable, and proportional mitigation in lieu fee of $2,024,875.37 ($1,642,543.50 for secondary impacts + $382,331.87 for direct fill); this fee is based on both these vernal pools' values, and on potential NECEC impacts on their functions, values and productivity. The proposed 5% multiplier and resulting mitigation fee is premised on data demonstrating that indirect impacts such as tree clearing do not result in significant degradation of these pools' ecological functions, productivity, or value, as explained below.

Clear throughout the Guidance is its inherent flexibility in determining the amount of compensatory mitigation. Accordingly, the standard compensatory mitigation ratios, expressed as multipliers in the Guidance, "are the starting point for developing appropriate compensatory mitigation, [and] <u>there continues to be flexibility on a project-by-project basis in order to achieve the most appropriate mitigation for a specific project</u>. This flexibility may lead to a determination by the Corps of an amount and type of compensatory mitigation that differs from that included here" (emphasis in original) (see page 12 of the Guidance). It is therefore appropriate in this case that the Guidance document's applicable compensation multiplier is, as noted above, "project specific," allowing consideration of the studies and project specific conditions described below.

Data gathered and evaluated by TRC Engineers, LLC ("TRC") based on a large MPRP vernal pool data set (presented in TRC's Position Paper on the Presence of Significant Vernal Pools in or Adjacent to Transmission Line Corridors in Maine (TRC Report) attached as Exhibits 9-7 and 9-8), demonstrate the likelihood that the majority of these vernal pools will retain their productivity and functions following construction of a transmission line. TRC's study of vernal pools within "soft" land use developments such as CMP transmission line corridors found that the reduction in forested canopy does not result in a significant loss of functions, and the data demonstrate that the highest value pools (i.e., significant vernal pools) continue to function without loss or significant degradation of their ecological functions after the forest canopy within their CTH has been removed.

TRC cites the MDIFW's finding that "approximately 40 to 50 percent of the natural vernal pools on the landscape were expected to meet the Chapter 335 Significant Wildlife Habitat Rules vernal pool significance criteria. The occurrence of significant natural vernal pools along the transmission corridors surveyed as part of the MPRP (44 percent) falls in the middle of that 40 to 50 range and compares well with regulatory expectations." TRC Report, Exhibit 9-7, page 10. TRC cites further evidence and concludes "that conversion of forest cover types to utility corridor can support and maintain viable and healthy populations of vernal pool breeding amphibians, even after time periods spanning multiple amphibian generations." TRC Report, Exhibit 9-7, page 11 ("Of note, 87.5 percent of significant vernal pools within the surveyed corridors contained less than 25 percent forested cover types within their CTH (within 250 feet of the pool depression). The transmission corridors that the pools are located within or along have been in existence and managed as non-forested, early-successional habitat for nearly half a century or more.").

TRC concludes, "no measurable loss of vernal pool functions is apparent in and along electric utility transmission corridors; in fact, significant vernal pools remain abundant and highly productive in the typical scrub/shrub habitat found in most transmission line corridors, even after multiple decades." TRC Report, Exhibit 9-7, page 1.

Thus, the TRC study results support the expectation that vernal pools impacted by a transmission line project will remain productive and abundant; as such, compensation for conversion from forested to scrub-shrub should recognize, and be commensurate with, this observed and likely retention of functions, values and productivity.

It should be noted that CMP developed the proposed $2,024,875.37 in lieu fee despite the fact that the functions and values of these vernal pools will not be negatively impacted, and the majority of these pools will retain their productivity and functions following construction of the NECEC transmission line. For this reason, CMP reserves the right to argue that the USACE does not have jurisdiction over these vernal pools, and that secondary impacts should not be considered by the USACE, because for most of these impacts there is no associated direct fill (permanent or temporary) of a jurisdictional aquatic resource (including wetlands) requiring a section 404 permit. Nonetheless, CMP has proposed this in lieu fee in an effort to resolve this issue to the satisfaction of the USACE, and in recognition that there may be minor (though unobserved in the MPRP dataset) impacts to these vernal pools' functions and values.

It also is noteworthy that CMP has already included compensation for conversion of forested wetlands in its Compensation Plan, including those that are within USACE-jurisdictional vernal pool CTH, with a

15% adjustment. In other words, for those wetlands located within the 750 foot USACE CTH, these impacts were already compensated for via a proposed in lieu fee. Thus the proposed $1,642,543.50 in lieu fee is reasonable and appropriate to compensate for forested upland conversion impacts within the vernal pool CTH, which is the only impact not otherwise compensated for.

As noted above, 49 high value USACE-jurisdictional vernal pools will be impacted by the Project. The proposed fee, which is calculated based on the fee structure outlined in the 2016 Guidance, is offered in addition the fee for direct fill. CMP applied the ratio of five (5) multiplied by 13,000 square feet to the resource-specific ILF formula and then applied a 5% adjustment to this calculation to develop the ILF to compensate for potential secondary impacts to upland portions of the CTH. Thus, for high value USACE-jurisdictional vernal pools, a payment to the ILF Program of $586,592.50 will be made.

For medium value vernal pools, the standard of 13,000 square feet was multiplied by three (3) and then a 5% adjustment was applied to the resource-specific formula for wetland impacts. For low value vernal pools, the standard of 13,000 square feet is multiplied by one (1) and then a 5% adjustment was applied to the resource-specific formula. There are 122 medium value vernal pools and 71 low value vernal pools which require compensation. When applying these formulas, CMP calculated that the ILF is $889,219.50 and $166,731.50, respectively.

In total, CMP will provide $2,024,875.37 to the ILF Program for compensation of direct and indirect impacts to USACE jurisdictional vernal pools.

9.2.1.9 Compensation of Other Impacts

In its December 12, 2017 Environmental Information Request, the MDEP requested that CMP provide a mitigation package to compensate for impacts to cold water fisheries and recreational uses of the outstanding river segments. The MDEP notes, “The Department envisions this mitigation package will be the responsibility of CMP to implement, not simply providing ILF monies.” In its response, CMP committed to reach agreement on the terms of compensation for Project impacts with the MDEP and USACE, which will avoid, minimize or mitigate those impacts through design, location, construction practices, ILF contribution and/or compensatory mitigation parcels.

On April 3, 2018, CMP, MDEP, and USACE held a working session to discuss the NECEC Compensation Plan. MDEP (Jim Beyer), maintained that the compensation package must include a combination of compensation components: ILF, preservation, and/or enhancement, to account for all Project impacts (most notably, impact to recreational uses of outstanding river segment and indirect impact to coldwater fisheries). CMP proposes a number of methods to offset impact to these resources,

including land preservation, a culvert replacement program, and incorporation of construction practices to protect coldwater fisheries habitat and enhancement, described within Sections 9.2.2.3 through 9.2.2.6. This plan, in combination with the ILF and the compensation parcels used to offset natural resource impacts, described in Sections 9.2.2.1 and 9.2.2.2, exceeds the minimum compensation amounts required and provides long term protection of protected natural resources in Maine.

9.2.1.9.1 Existing Recreational Uses of Outstanding River Segments

The Maine legislature protects certain rivers, "because of their unparalleled natural and recreational values, provide irreplaceable social and economic benefits to the people in their existing state." 12 M.R.S. § 403. The NECEC crosses the following five locations which are afforded special protection as outstanding river segments, as identified in 38 M.R.S. § 480-P and 12 M.R.S § 403:

- Upper Kennebec River
- Kennebec River below Wyman Dam
- Carrabassett River
- Sandy River
- West Branch of the Sheepscot River

The NRPA further governs proposed activities that cross any outstanding river segment as identified in section 480-P and provides that "the applicant shall demonstrate that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of the river segment." 38 M.R.S. § 480-D(8). CMP provided an alternatives analyses demonstrating that "no reasonable alternative exists" for each river segment the transmission line crosses. *See* NRPA Application, Chapter 2 (submitted to the USACE on September 29, 2017); Responses to Data Requests Letter (submitted March 29, 2018); NECEC Overhead Crossing of the Kennebec River Letter (submitted July 26, 2018).

As demonstrated by CMP, "no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of this river segment." CMP has therefore taken measures to minimize the Project impact to these resources. In the locations where the HVDC line is to be co-located within existing ROW, CMP has minimized additional clearing to an average additional width of 75 feet, and minimized additional natural resources impacts by proposing crossing locations in existing, developed transmission line corridors. CMP has proposed to cross under the upper Kennebec River using HDD in order to preserve the aesthetic value of this river segment and to prevent visual impacts to recreational and other river users. Additionally, in response to MDIFW's Environmental Review Comments (submitted July 13, 2018), CMP committed to retaining 100 foot riparian buffers at all outstanding river segments.

Approximately 425 linear feet or 850 feet of river frontage (each bank) designated as outstanding river segments will be permanently impacted by forested conversion during construction of the NECEC. As discussed in detail in Section 9.2.2.3, to offset impact to existing recreational uses of outstanding river segments, CMP is including land preservation of three tracts along the Dead River which collectively will add 1,053.5 acres to Maine's conserved lands and provide protection in perpetuity of 7.9 miles of river frontage along the Dead River, an outstanding river segment. In addition to the wealth of recreational opportunities (which are not limited to hiking, fishing, whitewater rafting, canoeing, snowmobiling, wildlife viewing and hunting), these tracts include the protection of Grand Falls waterfall, the largest horseshoe waterfall in the State, in perpetuity. Impacts to outstanding river segments will not unreasonably impact existing recreational uses of these rivers.

9.2.1.9.2 Indirect Impacts to Coldwater Fisheries

In its December 12, 2017 Environmental Information Request, MDEP notes that "the Project crosses 67 river, streams, or brooks, which contain brook trout habitat." The MDIFW's March 15, 2018 NECEC application review comments stated that "CMP's proposed 25 foot riparian buffer will not be adequate for the protection of water temperatures, water quality, and inputs of coarse woody debris necessary to support conditions required by brook trout and other aquatic life." As referenced by CMP's July 13, 2018 response to the MDIFW, a study by Gleason[65] on the impacts of powerline ROW on forested stream habitat found that despite the open canopy condition, water temperatures were slightly lower than in off-ROW areas and that none of the water quality parameters were significantly different between the on-ROW and off-ROW study areas. Gleason's study also found no correlation between percent canopy cover and mean percentage of fines and found no significant difference in the Benthic Index of Biotic Integrity scores between on-ROW and upstream areas. Similarly, a study conducted by Peterson[66] on the effects of electric transmission line ROWs on trout in forested headwater streams in upstate New York found that stream reaches in electric transmission ROWs were exposed to more light, had denser stream bank vegetation, were deeper and narrower, and had a greater area composed of pools. Peterson's study found that trout were more abundant in stream reaches within ROWs and concluded that the increase in incident sunshine resulted in a denser forb and shrub root mass which further stabilized stream banks, resulting in less stream bank erosion, deeper channels, and higher populations of trout. Peterson concluded that

[65] Gleason, N.C. 2008. Impacts of Power Line Rights-of-Way on Forested Stream Habitat in Western Washington. Environmental Symposium in Rights-of-Way Management, 8th International Symposium, pages 665-678.
[66] Peterson, A.M. 1993. Effects of Electric Transmission Rights-of-Way on Trout in Forested Headwater Streams in New York. North American Journal of Fisheries Management, vol. 13 pp. 581-585.

electric transmission ROWs need not constitute an adverse effect on headwater trout population densities in forested basins.

Nevertheless, in consideration of both MDEP's and MDIFW's expressed concern of indirect Project impacts from clearing of the transmission line ROW, CMP has revised its VCP and VMP (Attachment E of the 404 CWA Application) to expand the buffers for vegetation management and maintenance restrictions, as described below.

CMP will retain riparian natural buffers (or "riparian buffers") and implement restrictions, consistent with those described in the VCP and VMP, within 100 feet of all rivers, streams or brooks which meet the following criteria:

- Presence of Special Concern, Threatened or Endangered species,
- Coldwater fisheries,
- Outstanding River Segments, as identified in 38 M.R.S. § 480-P and 12 M.R.S § 403,
- All perennial streams within the Segment 1 portion of the Project.

For all other streams that do not meet the above criteria, CMP will apply a 75-foot buffer.

Extending the buffer to 100 feet for those streams which meet the above criteria will adequately protect coldwater fisheries. CMP also intends to replace improperly installed or non-functioning culverts to improve habitat connectivity as further described in Section 9.2.2.6.

Additionally, the Grand Falls Tract, Basin Tract, and Lower Enchanted Tract, located within an area of the State with an abundance of valuable coldwater fisheries and, collectively contain 63,440 linear feet or 12.02 miles of streams, including frontage on the Dead River and Enchanted Stream, which will be protected under a deed restriction or conservation easement.

Compensatory mitigation for secondary impacts to streams, as described in Table C4 of the USACE Mitigation Guidance, is only required if there is a discharge of dredged or fill material in CWA Section 404 waters that triggers jurisdiction. Other than the Culvert Replacement Program, proposed as part of this Plan to replace or remove non-functioning or improperly installed culverts and intended to enhance coldwater fisheries habitat and habitat connectivity, there will be no dredge or fill material placed in streams by the Project. Therefore, compensation for secondary impacts to these waterbodies under USACE jurisdiction is not required.

9.2.1.9.3 Impact to Deer Wintering Areas

According to data provided by the MDIFW, a total of 22 DWA are crossed by the NECEC transmission line corridor. All DWAs crossed by the Project are classified by the MDIFW as indeterminate in value, which means that they are recognized as candidate Significant Wildlife Habitat under the NRPA, but currently have no formal value rating. No DWAs are impacted by the Merrill Road Converter Station or Fickett Road Substation.

Of the 22 DWAs crossed, 11 will be subjected to some conversion of forested habitat to shrub and herbaceous cover types. Additional DWAs intersected by Segment 4 of the Project will not be affected as there will be no clearing within DWAs along this segment.

One DWA, located near the Upper Kennebec River, is crossed by the Project in Segment 1. This resource is "non-regulatory, but still important for consideration in planning to accommodate needs of wintering deer" according to Bob Cordes, MDIFW (email correspondence 8/15/17). Project impacts within the HDD project modification area include 5.75 acres of tree clearing, and 0.84 acres of permanent impact from construction of the HDD termination stations. The underground HDD crossing beneath the Kennebec River minimizes impact to the DWA by retaining approximately 1,450 feet and 1,160 feet of forested buffer on the east and west sides of the Kennebec River, respectively. Intact, mature riparian buffers or vegetation bridges provide good travel corridors for wintering deer and are particularly valuable in this area of Maine, which experiences high winter snow depths. A total of 39.209 acres of tree clearing is proposed within the Upper Kennebec DWA. Through consultation with MDIFW, to mitigate impact to this DWA, CMP is proposing a combination of preservation of lands within the larger Upper Kennebec DWA and the implementation of deer travel corridors in the proposed ROW as further described in Section 9.2.2.5.

Construction and maintenance of Segments 2, 3, and 5 will not significantly affect the habitat functional attributes of the DWAs intersected by the Project for the following reasons:

- Corridor construction will only widen existing, non-forested transmission line corridors by an average of approximately 75 feet. As such, functional effects on these DWAs are expected to be indiscernible. It is expected that after construction has been completed, these DWAs will function similarly to the way they currently do.

- CMP will maintain its transmission line corridors in a manner that encourages the growth of non-capable shrub species that can provide important winter browse for over-wintering deer and in accordance with the CMP's VMP and CMP's Environmental Guidelines (Attachment E of the 404 CWA Application).

CMP has avoided and minimized direct and temporary impact through adjusting pole placement where possible and minimizing temporary access roads through these areas. CMP proposes to enhance wildlife habitat in the Project corridor adjacent to DWA by revegetating disturbed soils in upland areas with a wildlife seed mix promoted and developed by the Sportsman's Alliance of Maine ("SAM") and the Maine Seed Company.

9.2.1.9.4 Impacts to Rare Plant and Unusual Natural Communities

CMP conducted field surveys for rare plants and unique natural communities within the Project area in July 2018. As a result of the surveys, 15 rare plant occurrences and 5 unique natural communities were identified within or immediately adjacent to the Project ROW. Through consultation with MNAP and the USFWS, CMP has addressed agency concerns for the rare plant occurrences through a combination of avoidance, minimization and construction best practices as detailed in Table 9-3, below.

Table 9-3: NECEC Rare Plant Avoidance, Minimization, and Mitigation Summary Table

Description	Common Name	Feature ID	Rank	Proposed Impact Based on Original Design	CMP Proposed Avoidance, Minimization, or Mitigation
Isotria medeoloides	Small whorled pogonia	ISME01AR	S1	Indirect impact, clearing	CMP proposes to avoid impact (additional clearing in proximity to this plant) by re-aligning the infrastructure within the existing corridor and eliminating tree clearing (See Figure 7-3 in Section 7.7.1.1). CMP will implement yearly monitoring for the first three (3) years following construction and once every three years thereafter.
Gentiana rubricaulis	Red stemmed gentian	GERU02AR	S1	No impact	CMP will flag the populations prior to construction, clearing should be done during frozen ground conditions or on matted travel lanes, CMP will restrict travel lanes where possible.
Gentiana rubricaulis	Red stemmed gentian	GERU03AR	S1	Clearing	CMP will flag the populations prior to construction, clearing should be done during frozen ground conditions or on matted travel lanes, CMP will restrict travel lanes where possible.
Dryopteris goldiana	Goldie's wood fern	DRGO01AR	S2	Indirect impact, the clearing limits are located within 20 feet of the population	CMP will flag this population prior to construction, maintain the riparian buffer adjacent to this occurrence and will plant non-capable species along the edge of the clearing limits to provide additional shading. Clearing will be performed by hand only to avoid heavy equipment disturbance. Additionally, to mitigate for indirect impacts related to tree clearing, CMP will provide a one-time contribution of $10,000 for MNAP rare plant survey efforts in Maine.
Carex siccata	Dryspike sedge	CASI02AR	S2	No impact	Install and maintain flagging for avoidance throughout construction. Poles to be removed should be cut at ground level, soil added, and the area allowed to revegetate.
Carex siccata	Dryspike sedge	CASI01AR	S2	No impact, Close to demo structure but likely not impact by activity. Hand cut and winch structure.	Install and maintain flagging for avoidance throughout construction. Poles to be removed should be cut at ground level, soil added, and the area allowed to revegetate.

Description	Common Name	Feature ID	Rank	Proposed Impact Based on Original Design	CMP Proposed Avoidance, Minimization, or Mitigation
Houstonia longifolia	Long leaved bluet	HOLO01AR	S2/S3	No impact, clearing limits shown on map but no clearing will be needed here	Install and maintain flagging for avoidance throughout construction and verify the correct placement of the access road during access road installation.
Gentiana rubricaulis	Red stemmed gentian	GERU01AR	S1	Clearing (Minor impact, clips an edge of the polygon)	CMP will flag the populations prior to construction, clearing should be done during frozen ground conditions or on matted travel lanes, CMP will restrict travel lanes where possible.
Gentiana rubricaulis	Red stemmed gentian	GERU04AR	S1	Clearing (Minor impact, clips an edge of the polygon)	CMP will flag the populations prior to construction, clearing should be done during frozen ground conditions or on matted travel lanes, CMP will restrict travel lanes where possible.
Gentiana rubricaulis	Red stemmed gentian	GERU04AR	S1	Clearing (Minor impact, clips an edge of the polygon)	CMP will flag the populations prior to construction, clearing should be done during frozen ground conditions or on matted travel lanes, CMP will restrict travel lanes where possible.
Trichophorum clintonii	Clinton's bulrush	TRCL01AR	S3	No impact	Install and maintain flagging for avoidance throughout construction.
Galium kamtschaticum	Boreal bedstraw	GALKAM002DMC	S2	No impact	Install and maintain flagging for avoidance throughout construction.
Galium kamtschaticum	Boreal bedstraw	GALKAM003DMC	S2	No impact	Install and maintain flagging for avoidance throughout construction.
Galium kamtschaticum	Boreal bedstraw	GALKAM001DMC	S2	No impact	Install and maintain flagging for avoidance throughout construction.
Lindernia dubia var. anagallidea	Yellowseed false pimpernel	LIDU01AG	SH	No impact	Install and maintain flagging for avoidance (protection of basin) and hand cutting of vegetation only.

Three (3) of the unique natural community types, meeting the minimum standards to qualify as a unique natural community, will be impacted by unavoidable tree clearing activities. These include portions of three Jack Pine communities, one Enriched Northern Hardwood Forest community, and one Hardwood River Terrace Forest community. The Hardwood River Terrace Forest community is within Segment 3 of the Project where project impacts have been minimized through co-location of corridors. These natural communities that will be impacted by the Project total 9.229 acres of habitat. The Jack Pine and Enriched Northern Hardwood communities are all located within Segment 1 of the Project (new corridor). CMP conducted an analysis of Segment 1 that compared the environmental impacts of siting the transmission line on the north and south sides of the 300-foot wide corridor and provided this analysis to the MDEP and USACE (filed May 8, 2018). The analysis concluded that the southern alignment as proposed would cause fewer environmental impacts and was the preferred alternative. Similarly, reduction of overall impact to the unique natural communities in Segment 1 favors the southern alignment (i.e., 6.4 acres of a total of 20.9 acres of unique natural community types within the corridor will be impacted as opposed to the 14.5 acres that would be impacted if the transmission line were located on the northern side of the corridor). As detailed in Section 9.2.2.7, CMP proposes a fee contribution of $1,224,526.82 to the Maine Natural Areas Conservation Fund to compensate for unavoidable impacts to unique natural communities.

9.2.2 Total Compensation

The compensation package consists of 13 mitigation parcels, 3 of which are proposed for preservation to partially offset unavoidable natural resource impacts and 10 of which will be placed into conservation to provide compensation for recreational impacts to outstanding river segments, protect and preserve riparian buffers, and preserve DWAs within the Upper Kennebec DWA. These 13 parcels, total 2,792.90 acres of land to be protected in perpetuity. CMP owns all of the tracts proposed for mitigation and will use the MDEP Declaration of Covenants and Restrictions ("DOCR") template, tailored for existing uses and encumbrances, and reserving appropriate rights to CMP to manage vegetation, and intends to maintain fee ownership of the property and manage it in compliance with the DOCR and associated restrictions (i.e., undeveloped in perpetuity) until such time that it is transferred to a qualified recipient. The DOCR will be recorded prior to the start of construction activities.

In addition, CMP will provide a payment of $3,074,416.06 to the ILF Program; a $649,771.95 payment to the Maine Endangered and Nongame Wildlife Fund; a $200,000 commitment for culvert replacements; a $1,234,526.82 payment to the Maine Natural Areas Conservation Fund and has included a number of habitat enhancements in the plan to improve habitat for coldwater fisheries, species of concern, and DWAs, further described as follows.

9.2.2.1 In-Lieu Fee

For those impacts offset through the ILF Program, compensation fees were calculated using the resource-specific formulas, based on the resource compensation rates and multipliers, as provided in the DEP ILF Fact Sheet (2017). The resource multiplier takes into consideration the significance of specific resources. Additionally, based on recommended guidance from the USACE and MDEP, an adjustment, or percentage of standard amount was applied to account for resources in which a full loss of functions and values do not occur.

As calculated within Exhibit 9-5.1 through 9-5.10 and summarized within Exhibit 9-5A, CMP is providing an ILF of $3,074,416.06 to off-set unavoidable impacts to resource functions and values as a result of the NECEC Project.

9.2.2.2 Compensation Parcels

MDEP allows for compensation which may include the restoration, enhancement, creation, or preservation of an area or areas that have functions or values similar to the area. 38 M.R.S. § 480-Z. CMP has selected its Flagstaff Lake, Little Jimmie Pond-Hardwood Tract, and Pooler Pond Tracts for preservation as mitigation. Of the three preservation tracts, only the Little Jimmie Pond-Harwood Tract will require "compensation work" in the form of enhancement through the control of invasive plant species on the property. Prior to construction, CMP will submit to the MDEP and USACE, for approval, an invasive species plan for the survey, control, and treatment of invasive species on the Project, including the Little Jimmie Pond-Harwood Tract. CMP will implement the control measures approved by MDEP and the USACE during the first full growing season following permit issuance and will submit a report by December 31st of that year documenting the efficacy of the treatment. CMP will provide follow up treatment if determined necessary by MDEP and USACE.

According to the USACE's 2016 Mitigation Guidance, preservation as mitigation "does reduce the threat of future impacts and may stem future aquatic resource degradation." Mitigation Guidance, p. 10. Furthermore, the USACE "encourages a combination of upland and aquatic resource preservation over aquatic resources-only preservation to offer better protection of aquatic functions," as state laws may not protect non-wetlands whose degradation would affect aquatic resources. Mitigation Guidance, p. 11. Pursuant to 33 C.F.R. § 332.3(h), preservation may be used to provide compensatory mitigation when:

(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;

(ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability

of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;

(iii) Preservation is determined by the district engineer to be appropriate and practicable;

(iv) The resources are under threat of destruction or adverse modifications; and

(v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

Each of the potential preservation tracts (Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract) included in this plan meets all of these criteria and provides important physical, chemical, or biological functions for the watershed in which it is located. A detailed description of each parcel is included in Exhibit 9-9: NECEC Potential Compensation Tract- Natural Resources Survey Results Report.

An analysis of the applicable regulatory framework and regional trends, prepared by the Musson Group and included as Exhibit 9-3, shows that each of these three tracts is open to development in ways that could damage these important functions and thereby threaten to adversely modify the ecological sustainability of the watershed.

The functions and values of the three preservation tracts are similar to the functions and values associated with Project impacts to wetlands. These three tracts will be used to offset permanent cover type conversion of forested wetlands, permanent fill in wetlands and temporary wetland fill in scrub-shrub wetlands. The three tracts contain 510.75 acres of wetlands and the functions and values present on the preservation tracts are more than sufficient to offset these impacts. A comparison of the functions and values of the Project impact types and the three preservation tracts is provided below in Table 9-4.

Documentation of CMP's title, right, or interest in each of the preservation tracts is included in Exhibit 9-10. For each property, CMP proposes to convey fee ownership to either a non-profit land trust/non-governmental organization or a state resource agency and the transfer document between the parties will contain deed covenants and restrictions to preserve the compensation tract and its ecological values in perpetuity.

Table 9-4: Functions and Values Comparison				
Impacts		Compensation		
Activity & Regulating Agency	Functions and Values Impacted[1]	Compensation Type	Site Name	Primary Functions and Values Provided[2]
Temporary Wetland Fill Impacts in Scrub Shrub Wetlands (USACE)	Temporary impacts to WH, FA, GW, and VQA	Wetland Preservation	Little Jimmie Pond-Harwood Tract	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
			Flagstaff Lake	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
			Pooler Pond Tract	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
Temporary Wetland Fill Impacts in Emergent Wetlands (USACE)	Temporary impacts to WH, FA, GW, and VQA	ILF	NA	NA
Permanent Cover Type Conversion of Forested Wetlands to Scrub Shrub (USACE)[3]	Conversion will result in no permanent loss of wetland functions or values. Functional shifts will occur with regards to GW, FA, NR, SS, WH, REC, UNQ, VQA, and ESH.	Wetland Preservation	Little Jimmie Pond-Harwood Tract	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
			Flagstaff Lake	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
			Pooler Pond Tract	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
Permanent Wetland Fill Impacts (MDEP & USACE)	Permanent loss of GW, PE, NR, WH, REC, UNQ, VQA, and ESH.	Wetland Preservation	Little Jimmie Pond-Harwood Tract	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
			Flagstaff Lake	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
			Pooler Pond Tract	GW, FF, FH, PE, STPR, NR, SS, WH, ED, REC
Permanent Cover Type Conversion in Upland Vernal Pool Habitat (MDEP & USACE)	Clearing of VP Habitats will result in a de minimus reduction in VP habitat value	ILF	NA	NA
Permanent Fill in Vernal Pool Habitat (MDEP & USACE)	WH	ILF	NA	NA

Table 9-4: Functions and Values Comparison				
Impacts		Compensation		
Activity & Regulating Agency	Functions and Values Impacted[1]	Compensation Type	Site Name	Primary Functions and Values Provided[2]
Direct and Indirect Impacts to High and Moderate Value Inland Wading Bird and Waterfowl Habitat (MDEP)	Clearing of IWWH habitats will result in a de minimis reduction of IWWH value	ILF	NA	NA

[1] Function & Value List: GW = Groundwater Recharge/Discharge, FA = Floodwater Alteration, FH = Fish & Shellfish Habitat, STPR = Sediment/Toxicant Retention, NR = Nutrient Removal, PE = Production Export, SS = Sediment and Shoreline Stabilization, WH = Wildlife Habitat, R = Recreation, ED = Educational & Scenic Value, VQA = Visual Quality and Aesthetics, ESH = Endangered Species Habitat, UH = Uniqueness/Heritage
[2] Source: CMP NECEC Potential Compensation Tracts- Natural Resource Survey Results (8/13/2018).
[3] Conversion of forested wetlands includes clearing within SVPH or IWWH.

9.2.2.3 Preservation for Recreational Uses of Outstanding River Segments

CMP is including, as part of this compensation plan to offset impact to existing recreational uses of outstanding river segments, land preservation of three tracts along the Dead River which collectively will add 1,053.5 acres to Maine's conserved lands and provide protection in perpetuity of 7.9 miles of river frontage along the Dead River, an outstanding river segment (12 M.R.S § 403).

These lands, as detailed within the *NECEC Potential Compensation Tract- Natural Resources Survey Results Report*, Exhibit 9-9, include the Grand Falls Tract, Lower Enchanted Tract, and Basin Tract (see Figure 9-2), which not only contain high quality natural resources but will also augment existing conserved lands, protect habitat connectivity, provide opportunity to expand recreational opportunities and trail networks, and provide long term protection of 7.9 miles along the Dead River, most notably used by whitewater rafting tourism companies. Adjacent conserved lands include two Western Mountain Conservation Easement ("CE") parcels, 457.84 and 560.35 acres, respectively, and the Dead River Trail and Conservation Corridor easement which includes 660.97 acres. In summary, the 1,053.5 acres contained within the Grand Falls Tract, Lower Enchanted Tract, and Basin Tract will add directly to adjacent conserved lands, which total approximately 1,679 acres, increasing the area conservation lands as a whole by 39%. The recreational opportunities and their relationship to other conserved lands are highlighted below.

Table 9-5

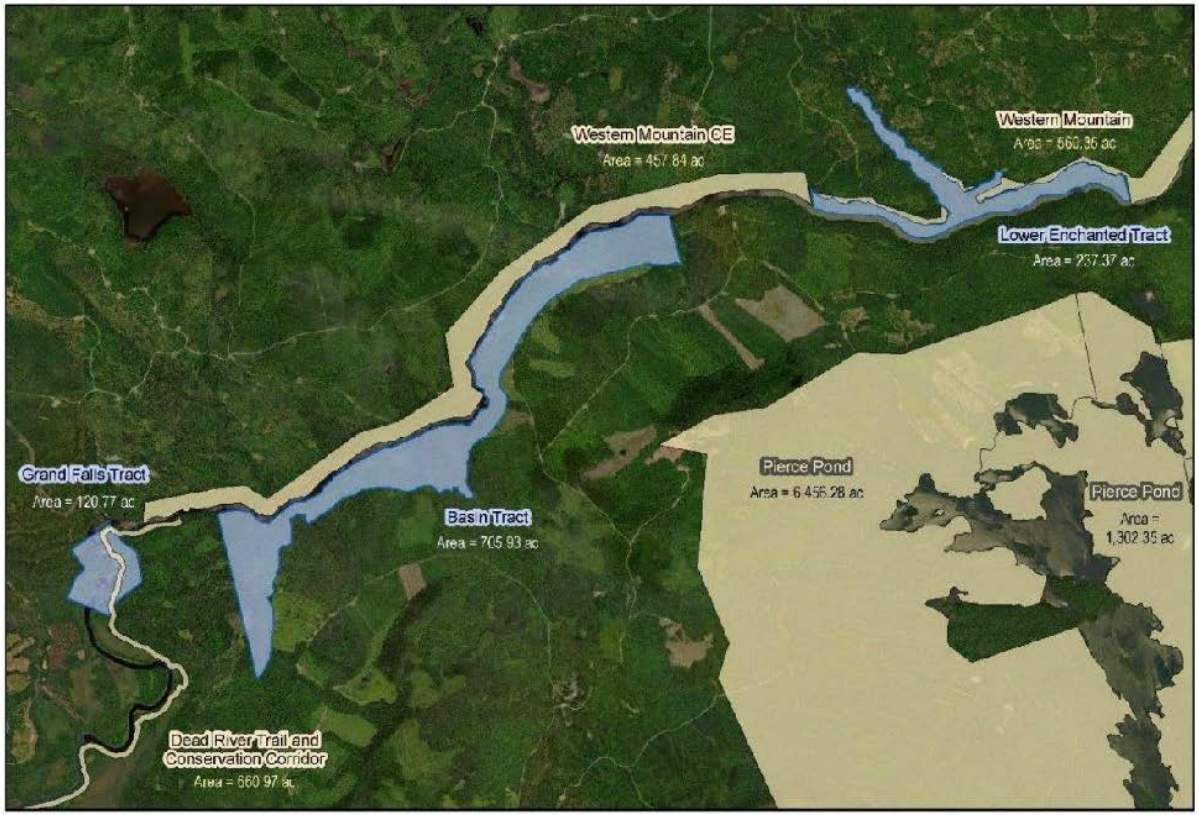
Tract	Dead River Frontage	Acres
Grand Falls Tract	1.4 miles (0.7 on each side)	120.84
Lower Enchanted Tract	2.3 miles along the north side	235.60
Basin Tract	4.2 miles along the south side	697.06
Total:	7.9 miles	1,053.50

Grand Falls Tract: The Dead River Trail and Conservation Corridor passes through this tract. This parcel is part of the Maine Huts & Trails network traveled by day and through hikers and also used for camping, cross country skiing and snowshoeing. The Northern Forest Canoe Trail traverses the tract connecting Flagstaff Lake with Spencer Stream and is the starting point for commercial Dead River rafting operations. The Tract is also highly regarded for trout and salmon fishing and hunting opportunities. The Grand Falls Tract has the largest horseshoe waterfall in the state. This tract is approximately 3.25 miles downstream, along the Dead River, of the 50,000 acre Bigelow Mountain-Flagstaff Lake-North Branch of the Dead River Focus Area of Statewide Ecological Significance. Within the intervening distance is a 1,542 acre moderate value IWWH, linking Grand Falls Tract with the Focus

Area. Conserved lands on this property are limited to the 200 foot wide Dead River Trail and Conservation Corridor on the east side of the river.

Lower Enchanted Tract: The Lower Enchanted Tract abuts the Western Mountain Conservation Easement parcel on both sides (east and west). Preservation of this tract will link segments of and expand on the Western Mountain Conservation Easement and will encompass approximately 0.7 miles on both sides of Enchanted Stream as well as 2.3 miles along the north shoreline of the Dead River. The Lower Enchanted Stream and the Dead River are very popular for brook trout and landlocked salmon fishing. Commercial river rafting on the Dead River passes along the shoreline of the Lower Enchanted Tract which also provides emergency access to the river.

Basin Tract: The Basin Tract includes approximately 4.2 miles of frontage along the south side of the Dead River. The Western Mountain Conservation Easement is located on the opposite shore of the Dead River, directly north of the Basin Tract. Commercial river rafting on the Dead River passes along the shoreline of the Basin Tract. Approximately one mile south of the 697-acre Basin Tract there are approximately 10,000 contiguous acres of Conserved Lands encompassing Pierce Pond, Grass Pond, Kilgore Pond, Split Rock Pond, Higher Pond, Dixon Pond, Fernald Pond, and Horseshoe Pond, and the Appalachian Trail Corridor. The Dead River is also highly regarded for brook trout and salmon fishing. Hunting opportunities are another recreational value of the Tract, as is its wetlands.



Legend

- Conserved Lands
- CMP Parcels

New England Clean Energy Connect
Proposed Lands for Conservation

0 0.5 1 Miles

New England Clean Energy Connect

Figure 9-1
Proposed Lands for Conservation

CENTRAL MAINE POWER

12/7/2018

9.2.2.4 Preservation of Riparian Buffers

MDEP and MDIFW have stated that conversion impacts to riparian buffers are compensable and have provided guidance to CMP to put forth a multifaceted plan to mitigate for these indirect impacts. The ILF Program does not provide a standard fee structure specific to habitat conversion within riparian buffers. In a meeting held between CMP, MDEP, and MDIFW on January 22, 2019, MDEP asked CMP to quantify forested conversion by calculating the linear feet of stream within the Project corridor whose riparian buffers would be converted from forested to scrub-shrub, and by calculating the linear feet of stream to be protected within the preservation parcels; monetary contributions and habitat enhancement would also count as additional compensation for these indirect impacts.

The NECEC will have 11.02 linear miles of forested conversion impact to streams; this includes all streams regardless of classification or value. The Grand Falls Tract, Lower Enchanted Tract, and Basin Tract contain a total of 12.02 linear miles of stream, providing greater than a 1:1 ratio.

In addition to preserving 12.02 miles of stream, CMP has also expanded the riparian buffers for vegetation management and maintenance activities. As discussed in Section 9.2.1.9, CMP will apply a 100-foot buffer to coldwater fishery habitats, outstanding river segments, RTE waterbodies, and all perennial streams in the new corridor portion (Segment 1) of the Project. CMP will apply an expanded buffer of 75 feet to all other streams that do not meet these criteria.

Further detailed in Section 9.2.2.6, CMP will make a contribution of $180,000 to the Maine Endangered and Nongame Wildlife Fund to protect coldwater fishery habitat and will implement a Culvert Replacement Program (Exhibit 9-11) which includes the repair, removal or replacement of culverts within CMP-controlled lands as well as $200,000 of funding, sufficient to replace approximately 20-35 culverts on lands outside CMP's ownership.

This plan is robust and addresses the various requests made by the agencies to compensate for the indirect impact of forest conversion to streams contained within the NECEC corridor.

9.2.2.5 Preservation for the Upper Kennebec Deering Wintering Area

As discussed in Section 9.2.1.9, the Upper Kennebec DWA was identified by MDIFW as a biological deer wintering area with nearly four decades of data collection and in an area of the state where wintering deer are vulnerable to deep snow depths. A total of 39.209 acres of tree clearing is proposed within the Upper Kennebec DWA. In addition to establishing deer travel corridors within the ROW in this habitat, described in Section 9.2.2.6, and through consultation with MDIFW, CMP is proposing preservation of

lands within the larger Upper Kennebec DWA to mitigate for unavoidable impacts and provide long term protection of this deer wintering area.

CMP has identified 7 parcels for preservation, depicted in Figure 9-3, which CMP owns and which are located in the Upper Kennebec DWA. The table below includes the total acreage for each parcel, and the net acreage, i.e., the acreage of each parcel located within the mapped DWA.

Table 9-6

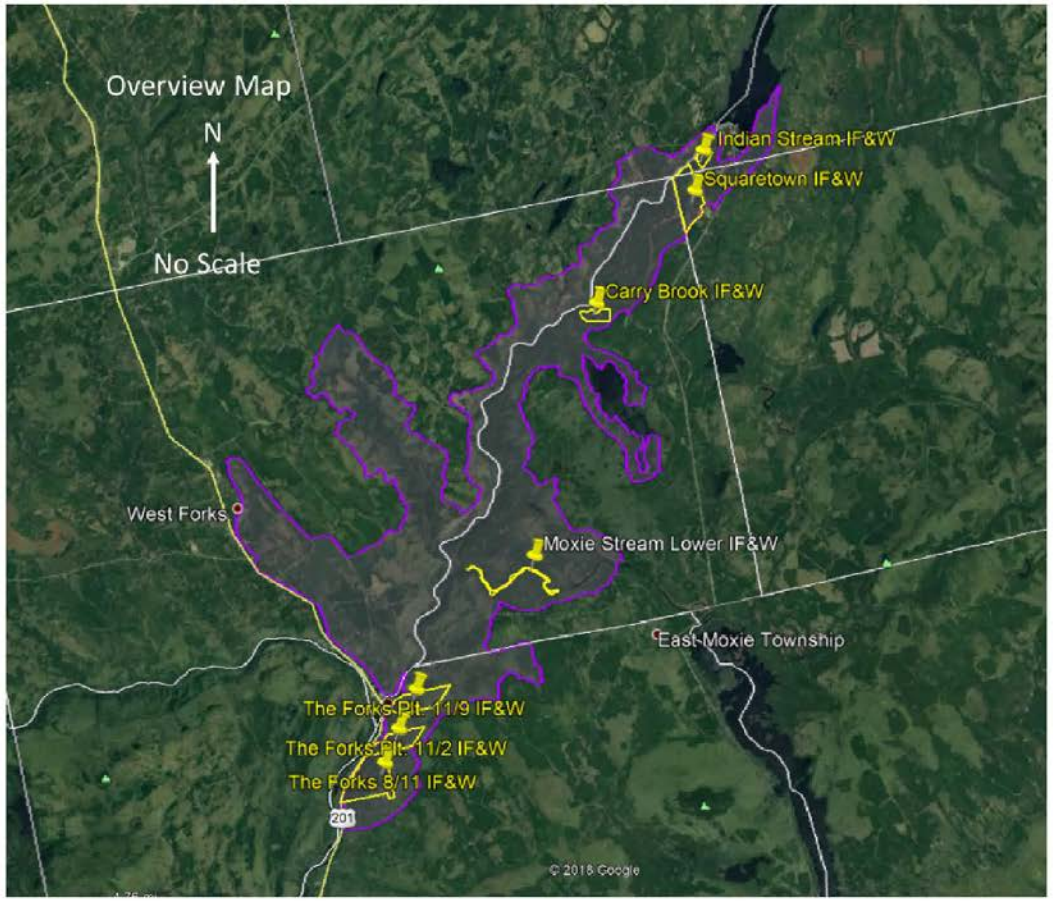
Parcel Name	Township	Total Acres	Less	Net Acres
The Forks Plantation. 11/9	The Forks Plantation.	130	5	126
The Forks Plantation. 11/2	The Forks Plantation.	109	7	102
The Forks Plantation. 8/11	The Forks Plantation.	233	5	228
Carry Brook	Moxie Gore	43	-	43
Moxie Stream Lower	Moxie Gore	29	-	29
Squaretown	Squaretown Township	164	-	164
Indian Stream	Indian Stream Township	25	-	25
			Total	**717**

CMP proposes to convey these properties to the Maine Bureau of Public Lands ("BPL") to be managed as deer wintering areas in perpetuity. The Forks Plantation. 11/9 lot abuts the existing Cold Stream BPL parcel and the 11/2 and 8/11 lots are in close proximity and abut each other. The Moxie Stream parcel is located in the center of the mapped DWA and contains a segment of Moxie Stream. The Squaretown and Indian Stream parcels are in the northern section of the DWA. The properties contain softwood and mixed forest stands, preferred habitat for deer during the winter months.

CMP previously agreed to allow a multi-use recreational trail across The Forks Plantation. Parcels to connect the Forks area trail systems (formerly the FAST Trail, Ridge Trail Section) from the Flood Road to the center of town, as part of a May 30, 2018 Memorandum of Understanding ("MOU") between CMP and the Western Mountain & Rivers Corporation ("WM&RC"). CMP will work with MDIFW to determine the specific construction, dimensions, location, and uses of this trail, such that the parcels retain their function and value as deer wintering areas.

MDIFW recommended that to appropriately mitigate for forest conversion within the Kennebec DWA, CMP should conserve land at an 8:1 ratio, which equals approximately 314 acres based on 39.209 acres

of forest conversion within the DWA. These parcels provide significantly more than the recommended 8:1 ratio, totaling 717 acres, an excess of 403 acres, and a ratio of greater than 18:1.



Legend

Preservation Parcel

Deer Wintering Area

New England Clean Energy Connect

Figure 9-3
Upper Kennebec DWA
Preservation Parcels

CENTRAL MAINE POWER

12/7/2018

9.2.2.6 Wildlife Habitat Protection and Enhancement

COLDWATER FISHERY MITIGATION

Coldwater fishery habitat is prevalent in the northern region of the Project. In fact, MDIFW has acknowledged, in an email from MDIFW Program Support Supervisor Robert Stratton –, that "viable brook trout habitat is not lacking in this region to the extent it might be elsewhere". Regardless, in addition to the 100 foot riparian buffer discussed in Section 9.2.1.9 above and the coldwater fishery habitat proposed for preservation, CMP is proposing the following measures to mitigate for coldwater fishery impacts and to improve coldwater fisheries habitat.

CMP has developed a culvert replacement program, in order to improve the habitat connectivity of coldwater fisheries in a number of locations where improperly installed, undersized, or damaged culverts are currently known to exist (Exhibit 9-11). In addition, within the Project ROW, CMP will replace existing culverts found to be damaged, installed improperly, or non-functioning. CMP will install replacement culverts consistent with Stream Smart Principles to improve or maintain habitat connectivity. In addition to replacing culverts within CMP-controlled lands associated with the Project, CMP will dedicate $200,000, sufficient to replace approximately 20-35 culverts on lands outside of CMP's ownership. CMP proposes to work with MDEP, MDIFW, and interested environmental non-governmental organizations, and to grant this money to the appropriate entity or entities who can identify those culverts most beneficial to replace, and who will manage and oversee their replacement. Additionally, CMP proposes a payment in the amount of $180,000 to the Maine Endangered and Nongame Wildlife Fund as additional mitigation for unavoidable indirect coldwater fishery impacts.

ROARING BROOK MAYFLY AND NORTHERN SPRING SALAMANDER HABITAT AVOIDANCE AND COMPENSATION

CMP executed surveys for Roaring Brook Mayfly and Northern Spring Salamander in the Fall of 2018. CMP will attempt to avoid crossing waterbodies with known occurrences of these two species. In the event alternative access cannot be found, CMP will coordinate with MDIFW regarding the location and placement of the equipment bridge prior to its installation. An environmental inspector will be present during installation of equipment bridges in these locations.

Through consultation with MDIFW, CMP agreed to modify its project design to include taller structures near Mountain Brook in Johnson Mountain Township and Gold Brook in Appleton Township to avoid and minimize impacts by allowing full height canopy to be retained within the conservation management areas associated with rare species in these locations. MDIFW agreed that for unavoidable impacts to all

other streams containing one or both of these species, a payment to the Maine Endangered and Nongame Wildlife Fund, using the MDEP ILF calculation (absent the wetland restoration and enhancement cost) at an 8:1 ratio is appropriate mitigation. As a result, CMP is proposing a contribution to the Maine Endangered and Nongame Wildlife Fund in the amount of $469,771.95.

HABITAT ENHANCEMENT FOR DEER WINTERING AREAS

The NECEC will have unavoidable forested conversion impacts to DWA, as discussed in in Section 9.2.1.9. In the co-located portions of the Project, CMP has minimized impact by siting the HVDC line in existing corridors, thus requiring minimal additional clearing to accommodate the line. Only one deer wintering area, the Upper Kennebec DWA, was identified in Segment 1 (new corridor).

The Upper Kennebec DWA will require 39.209 acres of forest conversion. CMP's HDD design change at the Kennebec River has minimized clearing impact to this resource by preserving approximately 2,610 linear feet between the two termination stations and the Kennebec River. There will be no tree clearing activities in these areas. These areas will continue to function as deer travel corridors, providing habitat connectivity, within the riparian buffer of the river.

The remainder of the Kennebec DWA consists of 10,179 linear feet of ROW, and through consultation with the MDIFW, CMP has identified an additional 8 travel corridors to maintain habitat connectivity within the DWA. These additional 8 travel corridors, totaling approximately 3,279 linear feet (32.2% of the cleared DWA traversed), will maintain connectivity for deer travel in the winter months. CMP will manage these travel corridors as described the VCP and VMP (Attachment E of the 404 CWA Application). These management standards were developed in close consultation with MDIFW.

CMP also proposes, to enhance wildlife habitat in and adjacent to DWA, to revegetate disturbed soils in upland areas with a Wildlife Seed Mix, promoted by SAM and developed with Maine Seed Company. This wildlife friendly seed mix will offer nutrition to deer and other wildlife such as moose, rabbits, ruffed grouse, geese, and wild turkeys during late fall and early spring when woods forage is sparse. The tender shoots derived from SAM's seed mix offer forage that is high in calories and protein, and deer find them to be highly digestible.[67]

[67] Lavigne, G., Experimental Wildlife Seed Mix Available through SAM, Maine Forest Products Council, June 2013.

Maine Seed Company's wildlife friendly seed mix contains highly nutritious cool season perennial grasses and clover that deer are attracted to in late fall and early spring. Other benefits[68] of the seed mix include:

- More wildlife-friendly than "conservation mixes"
- Provides superior deer nutrition immediately before and after the winter yarding season
- Grasses remain green and highly palatable into late fall/early winter, even under snow
- Contains five times the clover of "conservation mixes"
- White and red clover attract wildlife over most of the growing season
- Adaptable to a wide array of sites and soil conditions
- Cost effective - small seed size broadcast at only 25 lb./acre
- Plantings last several years with minimal maintenance.

9.2.2.7 Rare Plants and Unique Natural Communities

The NECEC will have unavoidable impacts to approximately 9.229 acres of unique natural communities, as discussed in Section 9.2.1.9. MNAP has not yet assigned a quality ranking to the unique natural communities that will be impacted by the Project. In further consultation with MNAP, MNAP specified that if CMP elected to pay a fee in lieu of preservation for conversion impacts to unique natural communities, CMP should quantify the area of impact using a 250-foot buffer and apply the average assessed land value per square foot of impact, with a resource multiplier of 8 to the calculation. A fee of $1,224,526.82 was calculated for these unavoidable impacts.

MNAP and CMP also agreed that a one-time contribution of $10,000 to fund MNAP rare plant surveys would be adequate compensation for forest conversion impact associated with the Goldie's Wood Fern.

A total of $1,234,526.82 will be contributed to the Maine Natural Areas Conservation Fund.

9.3 Conclusion

The NECEC Project will result in unavoidable temporary and permanent impacts to protected natural resources including freshwater wetlands, and is subject to the compensation requirements of the Wetlands and Waterbodies and Protection Rules (Chapter 310) and Significant Wildlife Habitat Rules (Chapter 335) of the Natural Resources Protection Act (38 M.R.S. §480-A-FF, and the Final Rule for

[68] Advertisement for Wildlife See Mix, SAM and Maine Seed Company, available at: http://sportsmansallianceofmaine.org/archive/archive_files/2016/SAM_Seed_2016_ad.pdf

Compensatory Mitigation for Losses of Aquatic Resources (40 CFR §230) pursuant to Section 404 of the U.S. CWA (33 U.S.C. § 1344).

Compensation for NECEC Project impacts includes: 2,793 acres of land for preservation; a $3,074,416.06 in-lieu fee payment; a $649,771.95 payment to the Maine Endangered and Nongame Wildlife Fund; a $200,000 commitment for culvert replacements; a $1,234,526.82 payment to the Maine Natural Areas Conservation Fund; and implementation of various wildlife habitat enhancement measures. The total land preservation and $5,158,714.82 in monetary compensation surpasses requirements set forth in these compensation Rules so that the national goals of no net loss of functions and values, articulated in a February 6, 1990 Memorandum of Agreement between the US EPA and US Army Corps of Engineers Concerning the Determination of Mitigation Under the CWA Section 404(b)(1) Guidelines, are fulfilled.

Exhibit 9-1: NECEC Mitigation Guidance: Compensation Ratios and Adjustments Per Agency

Exhibit 9-1: NECEC Mitigation Guidance: Compensation Ratios and Adjustments Per Agency

Impact Type		In Lieu (ILF) Fee Compensation (MDEP & USACE)[1]		Preservation Ratios[2]		Adjustments to Standard Ratios/Amounts[3]	
		Formula	Multiplier	MDEP	USACE	DEP	USACE
Wetland Impact	Permanent Fill in Wetlands (Non-WOSS)	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	8:1	30:1	100%	100%
	Permanent Fill in WOSS	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	2	8:1	30:1	100%	100%
	Temporary Wetland Fill in PEM (<18 months)	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	20:1	USACE only	5%
	Temporary Wetland Fill in PSS[4] (<18 months)	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	20:1	USACE only	10%
	Permanent Forested Wetland Conversion	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	20:1	USACE only	15%
Impact to MDEP Significant Vernal Pool Habitat (250')	Permanent Wetland Fill in SVPH	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	2	8:1	30:1	100%	100%
	Permanent Forested Wetland Conversion SVPH	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	8:1	20:1	60%	15%
	Permanent Upland Fill in SVPH	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	8:1	DEP only	100%	DEP only
	Permanent Upland Conversion in SVPH	Avg. Assessed Land Value/Sq. Ft	1	8:1	DEP only	60%	DEP only
Impact to USACE Jurisdictional Vernal Pool Habitat	Direct Fill in Vernal Pool Depression or 100' Envelope	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	Corps only	n/a	Corps only	100%
	High Value (750')	(13,000 Sq. ft x 5) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value)	1	Corps only	1 high: 5 med/high	Corps only	5%
	Medium Value (750')	(13,000 Sq. ft x 3) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value)	1	Corps only	1 med: 3 med/high	Corps only	5%
	Low Value (750')	(13,000 Sq. ft x 1) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value)	1	Corps only	1 low: 1 med/high	Corps only	5%
Inland Wading Bird & Waterfowl Habitat (IWWH)	Permanent Wetland Fill in IWWH	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	2	8:1	30:1	100%	100%
	Permanent Forested Wetland Conversion IWWH	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	8:1	20:1	60%	15%
	Permanent Upland Fill in IWWH	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	8:1	DEP only	100%	DEP only
	Permanent Upland Conversion in IWWH	Avg. Assessed Land Value/Sq. Ft	1	8:1	DEP only	60%	DEP only

[1] Source: USACE New England District Compensatory Mitigation Guidance 2016, DEP Fact Sheet In Lieu Fee Compensation Program Rev 8/13/2015

[2] Source: USACE New England District Compensatory Mitigation Guidance 2016, MDEP NRPA Chapter 335

3 Based on ratios and adjustments within the DEP Fact Sheet-In-Lieu Fee Compensation Program, 2016 USACE New England District Compensatory Mitigation Guidance and discussions held during the Compensation Working Session on 4/3/18, with the USACE and MDEP.

[4] Given that hydrology or significant soil disturbance will not result, all forested wetlands will convert to scrub-shrub wetland.

Exhibit 9-2: MDEP Letter RE: *Compensation for significant vernal pool habitats within transmission line corridors*, April 25, 2017

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

AUL R. LEPAGE
GOVERNOR

PAUL MERCER
COMMISSIONER

April 25, 2017

Adam Marquis
Central Maine Power Company
83 Edison Drive
Augusta, ME 04336

Re: Compensation for significant vernal pool impacts within transmission line corridors

Dear Mr. Marquis:

As part of Central Maine Power Company's efforts to maintain and improve its transmission capabilities, there are times when new clearing and line placement occurs within significant vernal pool habitat (SVP) as defined in the *Natural Resources Protection Act*, 38 M.R.S. § 480-A et seq. and Chapter 335 *Significant Wildlife Habitat* rules, 06-096 C.M.R. ch. 335.

During the course of permitting for the Maine Power Reliability Program project, the Department determined in consultation with the Department of Inland Fisheries and Wildlife that impacts to SVPs resulting solely from vegetation conversion from forested to scrub/shrub could be compensated for at a rate less than 100%. During that project, the Department determined that compensation at a rate of 60% of that required by Chapter 310 *Wetlands and Waterbodies Protection Rules* and the Department's *In Lieu Fee Compensation Program,* would be adequate to offset the loss in functions and values to SVPs for vegetation conversion only.

This letter is to inform you that the Department will continue to assess compensation at a rate of 60% for vegetation conversion within transmission line corridors should compensation be required and barring any unforeseen circumstance where the facts of the situation would warrant a different rate based on the loss of functions and values of a significant vernal pool habitat.

I hope this letter serves yours needs. Feel free to call me at 207-446-1611 should you have any questions or need further clarification.

Sincerely,

Michael K. Mullen, Director
Land Division, Bureau of Land Resources

cc. Alison Sirois, SMRO Regional Manager
Dawn Hallowell, CMRO Regional Manager
Jim Beyer, EMRO and NMRO Regional Manager

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PORTLAND
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PORTLAND, MAINE 04103
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PRESQUE ISLE
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PRESQUE ISLE, MAINE 04769
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ite: www.maine.gov/dep

Exhibit 9-3: Musson Group Letter Report
NECEC Compensation Plan Preservation Parcels, August 10, 2018

THE MUSSON GROUP Planning & Economic Development · Permitting · Project Management

August 10, 2018

Mr. Jay Clement
US Army Corps of Engineers, Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, Maine 04330

RE: NECEC Compensation Plan – Preservation Parcels

Dear Mr. Clement,

We have considered your May 3, 2018 comments regarding the information on the potential preservation tracts that we sent to you and Jim Beyer on April 29, 2018, as well as Jim's June 1, 2018 comments. Based on those comments, as discussed below, we eliminated several parcels from our compensation plan for purposes of satisfying Army Corps requirements, though we are including those parcels as part of our compensation plan for the DEP, to go above and beyond the DEP's minimum requirements and to offset unavoidable Project impacts that are not otherwise captured through its compensation plan.

The parcels that we eliminated from our compensation plan for purposes of satisfying Corps requirements are:

1. Grand Falls Tract;
2. Basin Tract; and
3. Lower Enchanted Tract.

The parcels that we believe satisfy the Corps' requirements, and which are discussed below, are:

1. Flagstaff Lake Tract;
2. Little Jimmie Pond-Harwood Tract; and
3. Pooler Pond Tract.

Please see Attachment A, which is a map showing all compensation tract locations. Individual parcel maps also are attached, at Attachments B-G, showing the location and development district or zoning of each parcel.

According to the Corps' 2016 New England District Compensatory Mitigation Guidance ("Mitigation Guidance"), preservation as mitigation "does reduce the threat of future impacts and may stem future aquatic resource degradation." Mitigation Guidance, p. 10. Furthermore, the Corps "encourages a combination of upland and aquatic resource preservation over aquatic resources-only preservation to offer better protection of aquatic functions," as state laws may not protect non-wetlands whose degradation would affect aquatic resources. Mitigation Guidance, p. 11. Pursuant to 33 C.F.R. § 332.3(h), preservation may be used to provide compensatory mitigation when:

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(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
(ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;
(iii) Preservation is determined by the district engineer to be appropriate and practicable;
(iv) The resources are under threat of destruction or adverse modifications; and
(v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

Each of the potential preservation tracts (Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract) that we are including in our plan meets all of these criteria and provides important physical, chemical, or biological functions for the watershed in which it is located. Our analysis of the applicable regulatory framework and regional trends shows that each of these three tracts is open to development in ways that could damage these important functions and thereby threaten to adversely modify the ecological sustainability of the watershed.

On the following pages we offer further analysis on each tract demonstrating that preservation may be used here to provide compensatory mitigation[1] because these parcels satisfy the criteria set forth in 33 C.F.R. § 332.3(h).

There are common themes that apply to each tract, including:

- **Access.** All three tracts – Flagstaff Lake, Little Jimmie Pond-Harwood, and Pooler Pond – are accessible via public roads, addressing the access concern that you and Jim raised in your comments. While Maine has a strong tradition of open access for members of the public to use private property for a wide variety of recreational activities free of charge, having direct access via a public road increases the likelihood of development.

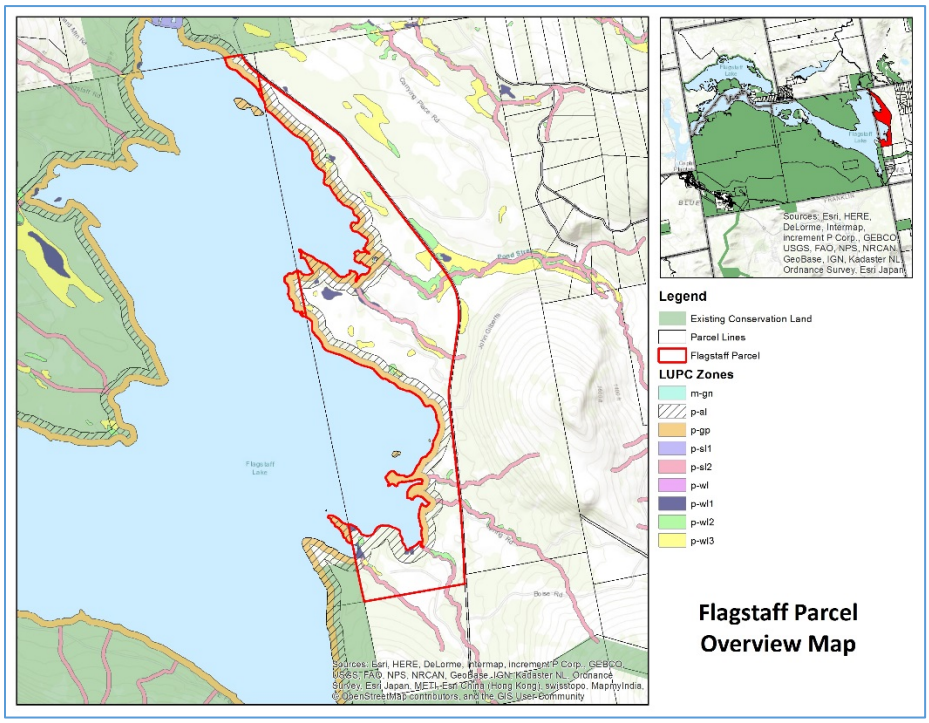
- **CMP's Development/Land Sale Policy.** Historically CMP's land policy has been to secure and retain certain surplus land to be offered as potential compensation (to be preserved in perpetuity) in order to offset unavoidable environmental impacts of future projects, including the NECEC Project. However, if regulatory agencies determine that specific tracts would not

[1] The Corps may consider mitigation as part of its Section 404 permitting, and because the Preferred Alternative is the least environmentally damaging practicable alternative, this compensatory mitigation may be considered and incorporated as a condition to the permit. *See Butte Environmental Council v. U.S. Army Corps of Engineers*, 620 F.3d 936, 946-947 (9th Cir. 2010) (rejecting plaintiff's contention that the USACE allowed the adoption of off-site mitigation measures to relieve the City of its responsibility to adopt the least environmentally damaging practicable alternative, and finding instead that while the Corps made compensatory mitigation a condition of the permit, "there is no indication that such mitigation was meant as an obligation in place of the City's responsibility to adopt the least environmentally damaging practicable alternative, as opposed to an obligation in addition to it."); *Florida Keys Citizens Coalition, Inc. v. U.S. Army Corps of Engineers*, 374 F. Supp. 2d 1116, 1132, 1134-35 (S.D. Fla. 2005) (upholding the Corps's Section 404 permit granted upon finding that "[t]he project as proposed with minimization efforts and mitigation ... is the least damaging practicable alternative.").

qualify as preservation/compensatory mitigation tracts because they are not, for example, under threat of destruction or adverse modification, CMP may consider offering these tracts for sale.

FLAGSTAFF LAKE TRACT

The Flagstaff Lake Tract (FLT) is approximately 831 acres located on the largely undeveloped eastern end of Flagstaff Lake in northwest Somerset County. The parcel has 4 miles of frontage along the Long Falls Dam Road, which is a paved public road and the main public access road to this area. The lake side of the property runs along the shoreline for approximately 8.5 miles. The property is defined by the 1150-foot contour line, which is just inland of the full lake elevation of 1146 feet. The land between the lake and the 1150-foot contour line is part of the Brookfield hydro project, but CMP has deeded access to this area that includes crossing rights and boat storage. Although the FLT is subject to flowage rights, such rights apply only to the extent to which such land has been historically flowed by the dam. Because the extent of such historical flowage is limited, and given the FLT's access right to Flagstaff Lake, the FLT could be developed at and above the highest typical and historical flowage elevations.



While your comments raise concern with the "level of human activity" at this parcel, echoed by Jim, existing development on the parcel is limited. Maine Huts and Trails (MHT) has constructed a popular lodge known as the Flagstaff Lake Huts along the northern shoreline and MHT maintains a trail network that crosses the property. The lodge and trail have been sited with sensitivity to the existing resources of the property, including wetlands and habitat. The facilities are operated to coexist with the important functions and values of the site and region. There is also one small leased camp near the middle of the property.

You also raised concern with this parcel's "tie in" to other protected parcels, a concern that Jim also noted. As discussed below, the FLT lies between the Maine Bureau of Parks and Land (MBPL) Dead River Peninsula property and Bigelow Preserve. Preservation of the FLT would link these two areas and close

a now open gap within the conservation land for this important part of the State of Maine, including over 8.5 miles of shoreline along Flagstaff Lake.

The property is located within Maine's Unorganized Territory and is regulated by the Land Use Planning Commission (LUPC). Much of the parcel is within a General Management Subdistrict (M-GN) where, in accordance to LUPC's Chapter 10 provisions, various land uses are permissible. Uses permitted without a permit include campsites, accessory structures, hand carry launches, trailed ramps, and forest management. Land uses that can be allowed through permitting include residential construction, subdivisions, and recreational lodging facilities. The parcel also includes the Wetland Protection Subdistrict (P-WL), including Wetlands of Special Significance (P-WL1, i.e., WOSS), Scrub-Shrub Wetlands (P-WL2, i.e., PSS), and Forested Wetlands (P-WL3, i.e., PFO). Other Protection Subdistricts on the FLT include Accessible Lake (P-AL), Great Pond (P-GP), Shoreland (P-SL2,), and Unusual Area (P-UA).

Physical, chemical, or biological functions
The existing functions and values of the FLT include the following (for more information please see the Natural Resources report from Power Engineers):

- *Lake Character*: Flagstaff Lake has been classified as a lake of statewide significance by LUPC due to its exceptional values. The Wildlands Lake Assessment identified it as having an outstanding resource rating for fisheries and for wildlife. It was rated as significant for scenic and shore character.

- *Wetland Resources*: FLT contains approximately 412 acres of a diverse mix of wetland types (PFO, PSS, PEM) at the center of which is a high value IWWH. In addition to the lacustrine shoreline, there is also approximately 9,800 linear feet of named and unnamed perennial and intermittent streams that cross the tract and are tributaries to Flagstaff Lake.

Flagstaff Lake Tract Summary	
Size	831.39 acres
NWI Wetlands	84 acres
Mapped Wetlands (delineated/GPS Identified)	412 acres
Inland Wading Bird/Waterfowl Habitat	30 acres
Upland Buffer Area	420 acres
Streams	9,810 linear feet
Non-Significant Vernal Pool Types	
1 PSVP 7 VPs 20 CVPs 39 PVPs	

- *Groundwater Recharge:* There are no Maine Geological Survey mapped sand and gravel aquifers on the FLT property. However, an esker at the south end of the lake is identified as a Significant Sand and Gravel Aquifer (MGS OF No. 01-132). The FLT is part of the surface hydrologic system draining into the lake and therefore helps to recharge this downgradient aquifer.

- *Fish Habitat:* Landlocked salmon, brook trout, yellow perch, chain pickerel, and an assortment of baitfish inhabit Flagstaff Lake and, although marginal for coldwater gamefish (MDIFW, 1988), in 2017 it was stocked with approximately 3,400, 7-to-8 inch landlocked salmon and brook trout to support the lake fishery for recreational anglers (MDIFW, 2018). Freshwater mussels observed

downstream along muddy shorelines of the Dead River are also likely to inhabit similar substrate in Flagstaff Lake.

- *Wildlife Habitat: M*oose, bear, deer, beaver, otter, mink, and other smaller mammals are abundant on FLT. In addition, FLT provides high quality habitat for a wide variety of raptors, waterfowl, gamebirds, passerines, songbirds, amphibians, reptiles, and insects. Habitat is further enhanced by the presence of a high rated IWWH (ID UMO-9951) near the center of the tract.

- *Recreation/Preservation:* FLT is at the crossroads of the MHT, Appalachian, and Northern Forest Canoe trail network traveled by day- and through-hikers and is also used for camping, cross-country skiing, and snowshoeing. Fishing and boating are widely used offerings of Flagstaff Lake, and hunting opportunities are also provided by FLT. When combined with the adjacent conservation lands, the FLT is part of a large conservation area comprising over 42,000 acres and over 8.5 miles of shoreline.

Overall, the FLT includes a combination of upland and aquatic resource preservation, rather than aquatic resources-only preservation, to offer better protection of aquatic functions (as state laws may not protect non-wetlands whose degradation would affect aquatic resources).

Ecological sustainability of the watershed

The resources listed above contribute significantly to the sustainability of the watershed. Palustrine wetlands along named and unnamed streams crossing FLT help to stabilize adjoining upland, thereby limiting and protecting lake degradation. The wetlands contribute to water quality in the lake as well as the downgradient aquifer. The tract consists of a variety of vegetative communities that provide different cover types, habitat characteristics, and ecological functions. Due to the large westward fetch of Flagstaff Lake, lacustrine and palustrine vegetated wetlands aligned along the east shore of the lake buffer and protect the adjoining shoreline from prevailing wind generated waves.

The FLT is within Maine's Western Mountain area, which is known for its natural resources and recreational opportunities. Multiple recreational trails, including the Appalachian Trail and the Northern Forest Canoe Trail, can be accessed from the FLT. The property lies between, and therefore links, the Maine Bureau of Parks and Land (MBPL) Dead River Peninsula property and the 36,000 acres of Public Land making up the Bigelow Preserve. Bigelow Mountain, with a highest elevation of 4,150 feet, and the view focal point from the property, is designated as a National Natural Landmark by the U.S. Department of the Interior.

Appropriateness and practicability of preservation

Preservation of FLT will allow for permanent protection from development and will preserve the existing wildlife habitat, water quality benefits, vernal pool habitat, and recreational/educational opportunities that are an integral component of the watershed. Approximately half of the 831.39 acre tract has a diverse mix of wetland types (PFO, PSS, PEM) at the center of which is a high value IWWH. There are approximately 9,800 linear feet of named and unnamed perennial and intermittent streams that cross the tract and are tributaries to Flagstaff Lake.

In addition, as noted in the section above, the FLT lies wholly within the 50,000-acre Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area. These are areas of Statewide Ecological Significance as identified by MNAP, MDIFW, MDMR, USFWS, TNC, Maine Audubon, and the Maine Coast Heritage Trust. This classification is based on the abundance of recreational opportunities and natural features and landscapes of exceptional ecological value. Preservation of this Tract along approximately 8.5 miles of the east shore of Flagstaff Lake will close a now open link between the conserved Bigelow Preserve to the south and the Dead River Peninsula to the north.

Preservation of this parcel is appropriate as it makes sense in the watershed context, provides protection of important aquatic resources, and is sustainable in the long-term.

Threat of destruction or adverse modifications

Like many areas in Maine, Somerset County has experienced population and economic decline, primarily due to the loss of manufacturing. However, in recent years Somerset County has shifted focus toward building a regional economy that takes advantage of the area's vast natural resources. Economic and community initiatives, such as the Somerset County Rural Cultural Plan, are working to shift the focus of growth and community development toward cultural opportunities, arts, and recreation. At the heart of these initiatives is the need to attract a steady flow of people to help preserve a sustainable population and economic base.

While removed from the core communities along Route 201, the FLT is positioned in a location that offers recreation-oriented development in the form of residential lots and/or recreational lodging facilities much like the existing MHT Flagstaff Lodge. The site has over 400 acres of upland available for development and offers over 8 miles of shoreline access on Flagstaff lake.

Residential Development. It is likely that any residential development on this site would take the form of single lots over a period of time rather than a full subdivision. Under current rules, landowners are allowed to create 2 lots every 5 years in each township without subdivision approval. This is known commonly as the "2 in 5 exemption". The LUPC has recognized that the "2 in 5" subdivision exemption could have negative implications to the principal values of the Unorganized Territory. These values, which include unique high-value natural resources and a unique natural character, are present in the FLT and surrounding lands. In any development analysis, the existing 2 in 5 exemption could result in several new lots, which would be sited in scattered and haphazard developments. This type of piecemeal development results in the loss of high value shoreline, forest fragmentation, and loss of recreational values.

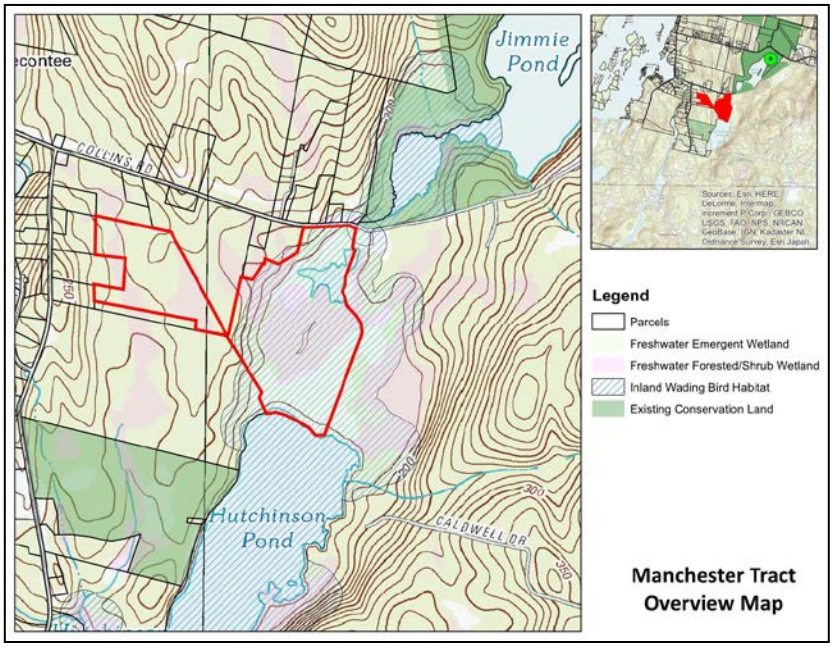
Recreational Lodging Development. The existing rules would allow the development of a recreational lodging facility. There are a several different scales of Recreational Lodging Facility that could be approved on the FLT. Within 500 feet of the shoreline the Chapter 10 rules allow for facilities that could accommodate a maximum overnight capacity of up to 100 people. Outside this area, the maximum size increases to allow a principal building of up to 12,000 SF and an overnight occupancy of up to 150 people. In addition to the risks of losing high value shoreline and of habitat fragmentation, one over-arching result of these types of developments is that the nature of the area could shift from a "backcountry" experience to an intensively managed recreation destination. This change would be contrary to the purposes for which the adjacent conservation parcels were established.

Forest Management Activities. According to the Forest Operations Notifications (FONS) from the last five and one-half years, within a 20-mile buffer of the FLT, the Maine Forest Service has received 784 notifications for forest management activities totaling 125,918.69 harvest acres. These notifications demonstrate that if this tract is determined to not qualify as a preservation/compensatory mitigation tract, and even if it were not sold for development, it would be under threat of destruction or adverse modification through forest management, which is common in this area.

In short, the parcel is open to development in ways that could damage the functions and values of wetland resources located there, and preservation would reduce the threat of future impacts and may stem future aquatic resource degradation.

Legal instrument
As part of the compensation package for NECEC, the entire tract will be permanently protected via a conservation easement or similar document.

LITTLE JIMMIE POND-HARWOOD TRACT



The Little Jimmie Pond-Harwood Tract (LJPT) is comprised of two separate parcels totaling approximately 110 acres. The property is accessible from the Collins Road, which is a public street in the Town of Manchester (about 6 miles from downtown Augusta). The LJPT has approximately 310 feet of road frontage along the Collins Road and approximately 900 feet of frontage on Hutchinson Pond.

The northern side of tract shares approximately 1,200-feet with the 886-acre Jamie's (Jimmie's) Pond Wildlife Management Area (WMA), which is managed by the Maine Department of Inland Fisheries and Wildlife (MDIFW). Jimmie's Pond is approximately 107 acres and is 75 feet deep. It is stocked with brook trout and splake. It also has small and large mouth bass and pickerel. The property provides habitat to numerous birds, including herons, hawks, loons, osprey and a wide variety of songbirds. Jamie's Pond is undeveloped but does provide carry-in boat access and six miles of hiking/cross-country skiing trails, which, with the surrounding woods, make Jamie's Pond a unique natural getaway in Central Maine. MDIFW manages the area primarily for wildlife.

LJPT is currently undeveloped but is actively used for recreational activities and hunting. The property is located within the Town's Rural Residential Zone, which allows for a mixture of uses including residential dwelling and commercial activities (with conditional use approval from the Town). Areas within 250 feet of the pond are in a Resource Protection Zone. LJPT was among the parcels considered in 2008 and 2009 for use in the compensation plan for the Maine Power Reliability Program (MPRP) project, and a natural resource inventory was completed on this parcel at that time.

Physical, chemical, or biological functions for the watershed

The existing functions and values of the LJPT include the following (for more information please see the Natural Resources report from Power Engineers):

- *Lake Character*: Hutchinson Pond has been classified by Maine DEP as a lake which is most at risk from new development. According to the Town's Comprehensive Plan, water quality is listed as "moderate-sensitive" and it would be very susceptible to phosphorous loading if not for its rapid flushing rate (seven flushes per year). The Kennebec Land Trust owns a 105-acre conservation parcel on Hutchinson Pond 2,765 feet of stream frontage and 1600 feet of undeveloped shoreline. They have recreational trails and access to the Pond. Nearby Jimmies Pond, which is connected to Hutchinson Pond by a small stream and wetland complex, contains a mixture of open water, shallow and deep marsh, shrub swamp, and flooded woodland. The area provides habitat for numerous species of waterfowl and wading birds, aquatic furbearers and other wildlife species. The 808 acres of upland habitat is predominantly mixed forest. The pond's shoreline remains largely undeveloped, making it popular with local anglers seeking to enjoy the unspoiled setting. It's also a quiet and scenic canoe or kayak.

- *Wetland Resources*: Approximately 66.46 acres (62%) of the 110 total acres of the LJPT were identified as wetland. The primary wetland system on the eastern parcel is a large emergent marsh (PEM) located on the northern end of Hutchinson Pond which extends off site and to the south from the southeast corner of the parcel. The portion of the marsh located on the LJPT totals approximately 50.5 acres. A perennial stream flows from the northern property boundary through the large marsh and into Hutchinson Pond (L1UB). The stream flow is relatively low velocity that has further slowed to a ponded condition by an active beaver dam. The marsh is surrounded by a perimeter of scrub-shrub wetland (PSS) that transitions into forested wetland in most locations before ultimately becoming upland forest both along the western marsh edge and within the large section of upland in the center of the marsh.

Little Jimmie Pont-Harwood Tract Summary	
Size	109.77 acres
Wetland Areas	66.97 acres
Inland Wading Bird/Waterfowl Habitat	75 acres
Upland Buffer Area	42.08 acres
Streams	3,030 linear feet
Vernal Pool Types	
2 PSVPs (42.80 acres of potential Critical Terrestrial Habitat) 6 VPs 2 ABA	

The most recent FIRM for this part of Manchester (Community Panel Nos. 23011 C0494D, C0513D effective date June 6, 2011), prepared FEMA identifies a 100-year floodplain associated with Inlet Stream that encompasses the wetland

southward from Collins Road to Hutchinson Pond (HP). On the west side of the parcel wetlands hydrologically connected to HP therefore also contribute to the function of flood flow alteration

- *Groundwater Recharge:* Groundwater recharge was noted as a primary function for the black spruce bog in the west parcel of LJPT as well as in the smaller isolated, seasonally flooded wetlands located throughout the property. Groundwater discharge was noted in the forested wetlands that are connected to the large emergent marsh in the east parcel as well as the black spruce bog and larger wetland system off-site to the west of LJPT.

- *Fish Habitat:* Surveys conducted by MDIFW indicate Hutchinson Pond has abundant warm water fish habitat, including pickerel and largemouth bass, white and yellow perch, pumpkinseed sunfish, baitfish and American eel. Brook trout are stocked annually in Jimmie Pond to the north of the parcel and likely migrate south into Hutchinson Pond during spring and fall when water temperatures are adequate.

- *Wildlife Habitat:* The variety of vegetation provides suitable habitat for a multitude of birds, reptiles, amphibians, insects, and mammals. The large marsh on the eastern part of the property has been mapped as IWWH (ID 031056) and provides outstanding habitat for species of birds. Deer Wintering Areas have also been identified on Beginning with Habitat maps in the forested area between the east and west parcels that comprise the LJPT. Upland areas associated with the wetlands provide additional habitat for various species which utilize a mix of wetland and upland habitats or those that typically utilize uplands as their primary habitat.

- *Recreation/Preservation:* The property is in close proximity to the greater Augusta area as well as between a WMA to the north and an existing conservation land parcel to the south. Numerous recreational opportunities are available on the property including, fishing, hunting, hiking, boating, and bird watching. The quality and type of wetlands on the property, soil types, diverse vegetation communities, and presence of numerous vernal pools would provide a vast array of educational opportunities for the public.

The LJHP Tract includes a combination of upland and aquatic resource preservation, rather than aquatic resources-only preservation, to offer better protection of aquatic functions (as state laws may not protect non-wetlands whose degradation would affect aquatic resources).

Ecological sustainability of the watershed

The resources listed above contribute significantly to the watershed. The LJPT is within the Kennebec River watershed and is connected hydrologically via the outlet of Hutchinson Pond, which drains into Cobbosseecontee Stream and ultimately connects with the Kennebec River approximately 10.5 downstream from the Tract. Immediately to the east of the tract on the opposite side of Benson Road is Beginning with Habitat's Cobbossee–Annabessacook Focus Area (BWH, 2018). The focus area is comprised of extensive areas of wetlands that provide habitat for wintering deer, rare species, and outstanding habitat for wading birds and waterfowl. Storm water runoff from uplands and small ephemeral streams that drain into the wetlands is dissipated within the organic soils and dense vegetation where nutrients carried with the runoff are processed into other forms and transferred to higher trophic levels in the ecosystem.

Open water and emergent marsh habitats in the west parcel have suitable organic and/or fine grained soils, slow moving water, variable water depths, flood storage capacity, and dense vegetation that are important and effective aspects of sediment, toxicant, and pathogen retention. The organic soils and long duration water retention time present in the black spruce bog in the west parcel also are important factors in sediment, toxicant, and pathogen reduction.

The emergent marsh in the east parcel is in a mapped floodplain and contains a riparian buffer area comprised of scrub-shrub wetland that transitions into forested wetland. The wetlands around the perimeter of the marsh are an important component of floodwater attenuation and help to provide overall stability for downstream water resources such as Hutchinson Pond.

Appropriateness and practicability of preservation

Preservation of this property will include 66.97 acres of diverse wetland habitat, 3,030 linear feet of streams, eight (8) vernal pools and 42.80 acres of vernal pool critical terrestrial habitat. Preservation of this tract will allow for permanent protection from development and will preserve the existing recreational opportunities, wildlife habitat, water quality benefits, vernal pool habitat, and educational opportunities of the LJPT.

The location of the LJPT in proximity to ecological focus areas, conservation lands, and protected wildlife areas provides enhanced value to the property from a protected land standpoint, primarily due to connectivity with these other parcels that will provide greater habitat functionality at a landscape scale. The current lack of development in the surrounding landscape and proximity to protected lands provides large buffer areas which augment the overall ecological functions of the property, specifically the diverse set of wetland systems located on site.

Preservation of this parcel is appropriate as it makes sense in the watershed context, provides protection of important aquatic resources, and is sustainable in the long-term.

Threat of destruction or adverse modifications

Development in this part of the Town of Manchester is primarily residential homes with small fields and secondary roads scattered throughout the area. Hutchinson Pond itself is lightly developed. Considering the property location within close proximity to Augusta (approximately 12.7 miles from Exit 109 on I-95 in Augusta), there are attractive options for future development

It is likely that any development on this parcel would be residential similar to the existing pattern of development in the area. Approximately twenty (20) acres or 18% of the property is zoned to permit single lot residential or duplex development with a permit from the Code Enforcement Officer. The minimum lot size, which is two acres, could allow an estimated ten homes to be built. Using the “2 in 5” subdivision exemption this type of development could have a negative impact on the wetlands and water quality of Hutchinson Pond. Subdivisions are also allowed with conditional use approval, as are several commercial activities. Overall, should development occur on this tract, it would cause fragmentation of the existing habitat and change the undeveloped nature of Hutchinson Pond.

Forest Management Activities. According to the FONS from the last five and one half years, within a 20-mile buffer of the LJPT, the Maine Forest Service has received 2,215 notifications for forest management activities totaling 89,221.97 harvest acres. These notifications demonstrate that if this tract is determined to not qualify as a preservation/compensatory mitigation tract, and even if it were not sold for development, it would be under threat of destruction or adverse modification through forest management, which is common in this area.

In short, the parcel is open to development in ways that could damage the functions and values of wetland resources located there, and preservation would reduce the threat of future impacts and may stem future aquatic resource degradation.

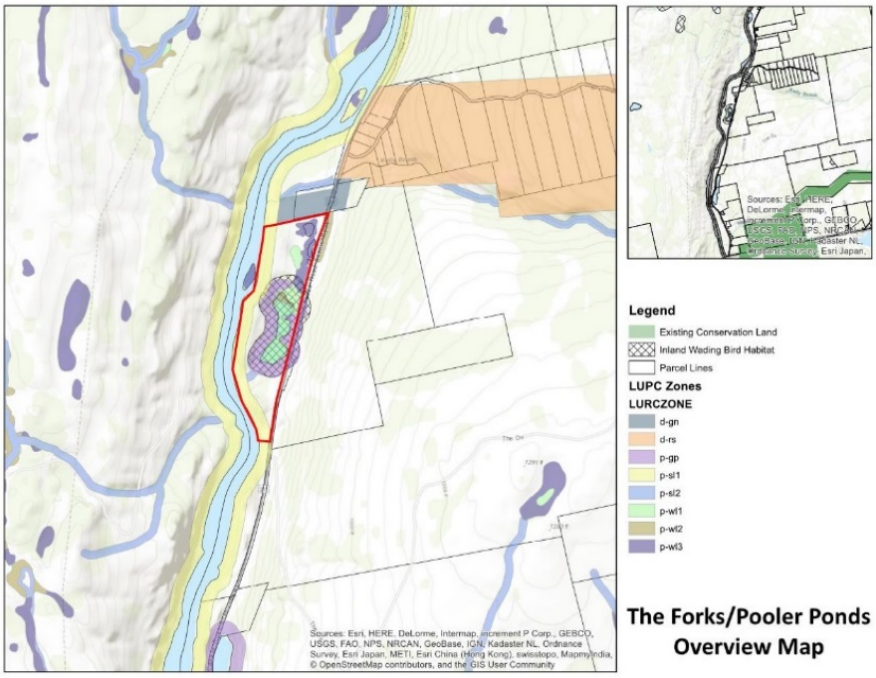
Legal instrument
As part of the compensation package for NECEC, the entire 110 acre (+/-) LJPT will be permanently protected via a conservation easement or similar document.

POOLER POND TRACT

The Pooler Pond Tract (PPT) is approximately 81 acres located along Maine Scenic Byway Route 201 in The Forks Plantation about 3 miles from the village of The Forks. The site has .8 miles of river frontage along the Kennebec and encompasses all of Pooler Pond.

There is no existing development on the property, however, a portion of the Forks Area Scenic Trail (F.A.S.T.) runs through the site between Pooler Pond and the River. The adjacent property is developed by a rafting and river campground.

The property is located within Maine's Unorganized Territory and is regulated under LUPC rules and guidelines. The parcel contains multiple zoning subdistricts including the Shoreland Protection Subdistrict (P-SL), the General Management Subdistrict (M-GN), Great Pond Subdistrict (P-GP), and Wetland Protection Subdistricts (P-WL). There are several permitted uses within each of these subdistricts including residential dwellings and campsites.



Retail stores, restaurants, and recreational lodging facilities are also allowed with special exception approval. Pooler Pond and the associated shoreline has been designated as an Inland Wading Bird and Water Fowl habitat by MDIFW. There are also areas wetland (and associated wetland zoning) around the northerly portion of the pond.

Physical, chemical, or biological functions for the watershed

Lake Character: Pooler Ponds (MIDAS # 4106) are designated as a "water quality limiting lake" (WQLL) sensitive to increased phosphorus concentrations and therefore is subject to additional residential development restrictions.

- *Wetland Resources*: Approximately 18.33 acres (22.6%) on PPT were identified as palustrine wetland. This includes the 8.12 acre Pooler Ponds complex (PUB) and 10.21 acres of additional palustrine wetland. The primary wetland system on this property is palustrine unconsolidated bottom (PUB) associated with the open water of the pond complex. The fringe of this wetland system is enveloped by a graminoid-dominant palustrine emergent area (PEM), which is bordered by a co-dominant palustrine scrub-shrub wetland (PSS). The Tract has approximately 0.8 river-miles of frontage along the Kennebec River, a permanently flooded, lower perennial riverine wetland system with an unconsolidated bottom (R2UBH). Where the land does not abruptly drop from bedrock cliff to river, there is generally a 20- to 50-foot strip of palustrine scrub shrub (PSS) wetland along the fringe of the Kennebec River.

  As mapped by the USDA NRCS on Web Soil Survey, approximately 56 acres (68%) of PPT is underlain by somewhat excessively drained (SED) soils. In addition to slightly more than 8 acres of waterbody, the remainder of the Tract is mapped as well drained. The soils are derived from glacial outwash plains, till plains and eskers consisting of fine silt loams and clay loams. Hydric soils were identified primarily along fringe wetlands that occur around most of Pooler Ponds and parts of the Kennebec River. The fringe wetlands associated with the pond are classified as PEM and PSS with some smaller components of PFO. A small PSS wetland was mapped along the Kennebec River consisting of fine loamy sands.

- *Groundwater Recharge:* PPT occurs on the Kennebec River Significant Sand and Gravel Aquifer. Onsite wetlands help groundwater discharge from up gradient, as well as recharge areas to the adjoining Kennebec River.

- *Fish Habitat:* The Kennebec River is popular for brook trout and landlocked salmon fishing. Pooler Ponds lack a perennial stream connection to the river and are most likely habitat for a warmwater fishery.

- *Wildlife Habitat:* PPT provides high quality habitat for a wide variety of wildlife including large mammals, raptors,

Pooler Pond Tract Summary	
Size	81.24 acres
Wetland Areas	18.33 acres
Inland Wading Bird/Waterfowl Habitat	31.39 acres
Upland Buffer Area	62.91 acres
Streams	4,480 linear feet
Vernal Pool Types	
1 VP	

waterfowl, passerines songbirds, amphibians, reptiles and insects. The property also has been mapped as a moderate value IWWH (ID UMO-9951) near the center of the Tract.

- *Recreation/Preservation:* PPT is located between a commercial rafting and river guide operation and campground immediately to the north and the Appalachian Trail Corridor 3.4 miles to the south. The Tract is also crossed by the F.A.S.T. and is an access point to fishing and boating on the Kennebec River. This easily accessible Tract provides diversity and abundance of aquatic plants and graminoids relevant to the study of botany and wetland ecology.

The PPT includes a combination of upland and aquatic resource preservation, rather than aquatic resources-only preservation, to offer better protection of aquatic functions (as state laws may not protect non-wetlands whose degradation would affect aquatic resources).

Ecological sustainability of the watershed
The resources outlined above contribute significantly to the ecological sustainability of the watershed. Riverine vegetated wetlands aligned along the east shore of the Kennebec River buffer and protect the adjoining upland shoreline from scour and erosion. Palustrine wetlands around the perimeter of Pooler Ponds also stabilize adjoining upland, thereby limiting and protecting lake degradation. The Tract provides a comprehensive mix of wetland types corresponding to the topographic gradient. PPT provides high quality habitat for a wide variety of wildlife including large mammals, raptors, waterfowl, passerines songbirds, amphibians, reptiles and insects.

In addition, this area of Route 201 is part of the Canada Scenic Byway and recognized for its recreational and scenic character. The area is developed with a mix of residential and commercial uses.

Appropriateness and practicability of preservation
There are no conserved lands or focus areas immediately adjacent to or within one mile of PPT. However, this area is important to the preservation of the watershed and recreational nature of the area. As part of the compensation package for NECEC, the approximately 81.24 acre Pooler Ponds Tract will be permanently protected. Preservation of this Tract along approximately 0.8 miles of the Kennebec River will secure access for rafting, other boating/ canoeing and fishing. In addition, preservation of PPT will result in permanent protection from development and will preserve the existing wildlife habitat, water quality benefits, vernal pool habitat, and educational opportunities adjacent to a Maine Scenic Byway.

Preservation of this parcel is appropriate as it makes sense in the watershed context, provides protection of important aquatic resources, and is sustainable in the long-term.

Threat of destruction or adverse modifications
Like the FLT, this property is located in a part of the state where the regional economy is shifting toward a focus on cultural opportunities, arts and recreation. This property has the same development opportunities due to the proximity of the site to existing development (3.5 miles to the village of The Forks, 4 miles to Caratunk, 20 miles to Bingham), availability of shore frontage for direct access to the Kennebec, shore frontage on Pooler Pond, and accessibility to a main road. It is likely that development

would be in the form of residential homes or camp style development, overnight accommodations, or recreational development, much like the FLT. Even without formal subdivision approval, development in the form of single lots over a period of time, using the "2 in 5 exemption", could have negative implications to unique undeveloped character of the river frontage and shoreline around Pooler Ponds.

Residential Development. It is likely that any residential development on this site would take the form of single lots over a period of time rather than a full subdivision. Under current rules, landowners are allowed to create 2 lots every 5 years in each township without subdivision approval. This is known commonly as the "2 in 5 exemption". The LUPC has recognized that the "2 in 5" subdivision exemption could have negative implications to the principal values of the Unorganized Territory. These values, which include unique high-value natural resources and a unique natural character, are present in the PPT and surrounding lands. In any development analysis, the existing 2 in 5 exemption could result in several new lots which would be sited in scattered and haphazard developments. This type of piecemeal development results in the loss of high value shoreline, forest fragmentation, and loss of recreational values.

Recreational Lodging Development. The existing rules would allow the development of a recreational lodging facility. There are a several different scales of Recreational Lodging Facility that could be approved on the FLT. Within 500 feet of the shoreline the Chapter 10 rules allow for facilities that could accommodate a maximum overnight capacity of up to 100 people. Outside this area, the maximum size increases to allow a principal building of up to 12,000 SF and an overnight occupancy of up to 150 people. In addition to the risks of losing high value shoreline, one over-arching results of these types of developments is that the nature of the area could shift from a "backcountry" experience to an intensively managed recreation destination. This change would be contrary to the purposes for which the adjacent conservation parcels were established.

Forest Management Activities. According to the FONS from the last five and one half years, within a 20-mile buffer of the PPT, the Maine Forest Service has received 627 notifications for forest management activities totaling 156,568.27 harvest acres. These notifications demonstrate that if this tract is determined to not qualify as a preservation/compensatory mitigation tract, and even if it were not sold for development, it would be under threat of destruction or adverse modification through forest management, which is common in this area.

The parcel is open to development in ways that could damage the functions and values of wetland resources located there, and preservation would reduce the threat of future impacts and may stem future aquatic resource degradation.

Legal instrument.
As part of the compensation package for NECEC, the entire tract will be permanently protected via a conservation easement or similar document.

Please do not hesitate to contact me if you have any questions.

Sincerely,
The Musson Group

Noel Musson, Principal

Enclosures

Exhibit 9-4: NECEC Compensation Package Summary

Exhibit 9-4 Compensation Package Summary as Required by USACE and NRPA

Project Impact				Compensation Required[1]			Compensation Sites			
Activity		Square feet	Acres	Agency Required by	Compensation Ratio X Adjustment[2]	Estimated Quantity Required	Flagstaff Lake Tract Total Acres= 831.39	Little Jimmie Pond-Harwood Tract Total Acres= 109.77	Pooler Pond Tract Total Acres= 81.24	Total Compensation Total Area= 1022.40
Impact to Wetlands	Permanent Fill in Wetlands (Non-WOSS)	13,389	0.307	USACE & MDEP	30:1 [6] USACE ratio applied	9.22	423.96 of wetland preservation	68.46 of wetland preservation	18.33 of wetland preservation	510.75 acres of wetland preservation to offset 4.12 acres of Permanent Fill in Wetlands (WOSS and Non-WOSS), 28.51 acres of Temporary Wetland Fill in PSS, and 105.55 of Permanent Forested Wetland Conversion, which is 13.45 acres over the amount of compensation required. $154,535.04 ILF for Temporary Wetland Fill in PEM.
	Permanent Fill in WOSS[3]	166,146	3.814	USACE & MDEP	30:1 [6] USACE ratio applied	114.43				
	Temporary Wetland Fill in PEM (<18 months)	835,486	19.180	USACE	See Exhibit 1-5A In-Lieu Fee Summary					
	Temporary Wetland Fill in PSS[4] (<18 months)	1,241,744	28.507	USACE	20:1 x 0.10 USACE ratio applied	57.01				
	Permanent Forested Wetland Conversion[5]	4,597,680	105.548	USACE	20:1 x 0.15 USACE ratio applied	316.64				
	Total Impact:	6,854,445	157.356		**Total Ac. Required:**	497.30				
Impact to Significant Vernal Pool Habitat (250')	Permanent Wetland Fill in SVPH	32,365	0.743	USACE & MDEP	See Exhibit 1-5A In-Lieu Fee Summary		See Exhibit 1-5A In-Lieu Fee Summary			$641,653.12 ILF amount
	Permanent Forested Wetland Conversion SVPH	169,670	3.895	USACE & MDEP						
	Permanent Upland Fill in SVPH	31,370	0.720	MDEP						
	Permanent Upland Conversion in SVPH	1,289,691	29.607	MDEP						
	Total Impact:	1,523,096	34.965		**Total Ac. Required:**	n/a				
Impact to USACE Jurisdictional Vernal Pools	Direct Fill in Vernal Pool Depression or 100' Envelope	96,610	2.218	USACE	See Exhibit 1-5A In-Lieu Fee Summary		See Exhibit 1-5A In-Lieu Fee Summary			$2,024,875.37 ILF amount
	High Value Vernal Pools[7]	49		USACE						
	Medium Value Vernal Pools	122		USACE						
	Low Value Vernal Pools	71		USACE						
	Total Impact:	2.22 acres of direct fill / 242 vernal pools								
Impact to Inland Wading Bird & Waterfowl	Permanent Wetland Fill in IWWH	149	0.003	USACE & MDEP	See Exhibit 1-5A In-Lieu Fee Summary		See Exhibit 1-5A In-Lieu Fee Summary			$253,352.53 ILF amount
	Permanent Forested Wetland Conversion IWWH	114,232	2.622	USACE & MDEP						
	Permanent Upland Fill in IWWH	598	0.014	MDEP						
	Permanent Upland Conversion in IWWH	539,556	12.387	MDEP						
	Total Impact:	654,535	15.026		**Total Ac. Required:**	n/a				
									Total In-Lieu Fee Payment	**$3,074,416.06**
									Total Compensation Land	**1022.40 Acres**

[1] Based on ratios and adjustments within the DEP Fact Sheet-In-Lieu Fee Compensation Program, 2016 USACE New England District Compensatory Mitigation Guidance and discussions held during the Compensation Working Session on 4/3/18, with the USACE and MDEP, as shown in Exhibit 1-1.

[2] In each case where compensation is required by both the MDEP and USACE, the higher ratio and adjustment was applied.

[3] Permanent wetland fill to PEM and PSS wetlands within SVPH and IWWH are excluded from this calculation and are calculated separately within their own respective categories.

[4] Given that hydrology or significant soil disturbance will not result, all forested wetlands will convert to scrub-shrub wetland.

[5] Conversion of forested wetlands excludes clearing within SVPH or IWWH and are calculated separately within their own respective categories.

[6] CMP offered a ratio of 30:1 to the USACE, which is above the 20:1 required, for land preservation for their consideration of the compensation parcels offered as part of this plan.

[7] Excludes impacts to SVPH.

Exhibit 9-5A: In Lieu Fee Summary
Exhibit 9-5B:Summary of Compensation Resulting from Consultation with Resource Agencies
Tables 9-1.1 through 9-1.12: ILF Calculations Tables

Exhibit 9-5A: In-Lieu Fee Summary

Impact Type		Resource Impact		In Lieu (ILF) Fee Compensation (MDEP & USACE)[1]		Adjustments to Standard Ratios/Amounts[2]		ILF Payment
		Sq ft	Acres	Formula	Multiplier	DEP	USACE	
Wetland Impact	**Permanent Fill in Wetlands (Non-WOSS)** See Exhibit 1-4	13,389	0.307	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	100%	100%	Preservation, See Exhibit 1-4
	Permanent Fill in WOSS[3] See Exhibit 1-4	166,146	3.814	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	2	100%	100%	Preservation, See Exhibit 1-4
	Temporary Wetland Fill in PEM (<18 months) See Table 1-5.1	835,486	19.180	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	5%	$154,535.04
	Temporary Wetland Fill in PSS[4] (<18 months) See Exhibit 1-4	1,241,744	28.507	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	10%	Preservation, See Exhibit 1-4
	Permanent Forested Wetland Conversion[5] See Exhibit 1-4	4,597,680	105.548	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	15%	Preservation, See Exhibit 1-4
Impact to MDEP Significant Vernal Pool Habitat (250')	**Permanent Wetland Fill in SVPH** See Table 1-5.2	32,365	0.743	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	2	100%	100%	$244,669.00
	Permanent Forested Wetland Conversion SVPH See Table 1-5.3	169,670	3.895	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	60%	15%	$335,360.93
	Permanent Upland Fill in SVPH See Table 1-5.4	31,370	0.720	Avg. Assessed Land Value/Sq. Ft	1	100%	DEP only	$5,294.90
	Permanent Upland Conversion in SVPH See Table 1-5.5	1,289,691	29.607	Avg. Assessed Land Value/Sq. Ft	1	60%	DEP only	$56,328.29
Impact to USACE Jurisdictional Vernal Pool Habitat[7] (750')	**Direct Fill in Vernal Pool Depression or 100' Envelope** See Table 1.5.6a	96,610	2.218	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	USACE only	100%	$382,331.87
	High Value Vernal Pools[7] See Table 1.5.6b	49 High Value Vernal Pools		(13,000 Sq. ft x 5) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value)	1	USACE only	5%	$586,592.50
	Medium Value Vernal Pools See Table 1.5.6c	122 Medium Value Vernal Pools		(13,000 Sq. ft x 3) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value)	1	USACE only	5%	$889,219.50
	Low Value Vernal Pools See Table 1-5.6d	71 Low Value Vernal Pools		(13,000 Sq. ft x 1) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value)	1	USACE only	5%	$166,731.50
Inland Wading Bird & Waterfowl Habitat (IWWH)	**Permanent Wetland Fill in IWWH** Table 1-5.7	149	0.003	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	2	100%	100%	$1,165.18
	Permanent Forested Wetland Conversion IWWH Table 1-5.8	114,232	2.622	Natural Resource Enhancement & Restoration Cost/Sq. Ft. X Avg. Assessed Land Value/Sq. Ft	1	60%	15%	$238,446.60
	Permanent Upland Fill in IWWH See Table 1-5.9	598	0.014	Avg. Assessed Land Value/Sq. Ft	1	100%	DEP only	$56.80
	Permanent Upland Conversion in IWWH See Table 1-5.10	539,556	12.387	Avg. Assessed Land Value/Sq. Ft	1	60%	DEP only	$13,683.95
					Total In-Lieu Fee Payment			**$3,074,416.06**

[1] In each case where compensation is required by both the MDEP and USACE, the higher ratio and adjustment was applied.

[2] Ratios and adjustments are based in part on the DEP Fact Sheet-In-Lieu Fee Compensation Program, 2016 USACE New England District Compensatory Mitigation Guidance and discussions held during the Compensation Working Session on 4/3/18, with the USACE and MDEP, as shown in Exhibit 1-1.

[3] Permanent wetland fill to PEM and PSS wetlands within SVPH and IWWH are excluded from this calculation and are calculated separately in their own respective categories.

[4] Given that hydrology or significant soil disturbance will not result, all forested wetlands will convert to scrub-shrub wetland.

[5] Conversion of forested wetlands excludes clearing within SVPH or IWWH, and are calculated separately in their own respective categories.

[6] Permanent wetland fill and forested wetland conversion impacts (shaded gray) in SVPH are included in the calculations provided in the Wetland Impact section of the table.

[7] Excludes impacts to SVPH.

[8] Permanent wetland fill and forested wetland conversion impacts (shaded gray) in IWWH are included in the calculations provided in the Wetland Impact section of the table.

Exhibit 9-5B: Summary of Compensation Resulting from Consultation with Resource Agencies

Impact Type		Resource Impact		Compensation Rationale	Resource Agency/Fund	Monetary Contribution/Land Preservation
		Sq ft	Acres			
Impact to Unique Natural Communities (MNAP)	Forested Conversion in Unique Natural Communities See Table 1-5.11	402,008	9.229	(Area of impact + MNAP identified directional buffers) x Avg. Assessed Land Value/Sq. Ft [1] x Multiplier of 8	Maine Natural Areas Conservation Fund	$1,224,526.82
	Forested Conversion to Goldie's Wood Fern	Goldie's Wood Fern		MNAP determined that adequate compensation for clearing impacts to the Goldie's Wood Fern is funding for rare plant surveys. The amount of funding was mutually agreed upon by MNAP and CMP.	Maine Natural Areas Conservation Fund	$10,000.00
Impact to Rare Species Streams (MDIFW)	Forested Conversion in the Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas See Table 1-5.12	1,150,681	26.416	Avg. Assessed Land Value/Sq. Ft[1] x Multiplier of 8[2]	Maine Endangered and Nongame Wildlife Fund	$469,771.95
Impact to Coldwater Fisheries (MDEP / MDIFW)	Forested Conversion in Riparian Buffers	11.02 linear miles of all waterbodies within the NECEC project area will be impacted by forested conversion.		The Grand Falls Tract, Lower Enchanted Tract, and Basin Tract total 1053.50 acres, and contain 12.02 linear miles of stream to offset forest conversion impacts to riparian buffers within the NECEC project area.	Conservation recipient to be determined	1053.50 acres of Land Preservation containing 12.02 linear miles of stream.
				The Culvert Replacement Program includes repair, removal or replacement of culverts within CMP-controlled lands during construction of the NECEC. Additionally, CMP will provide funding sufficient to replace approximately 20-35 culverts on lands outside of CMP's ownership.	Grant recipient to be determined	$200,000.00
				The monetary contribution amount was based on the estimated labor and equipment costs to implement Chop and Drop on 87 perennial streams (Segment 1), which has been removed from the Compensation Plan at the request of MDIFW.	Maine Endangered and Nongame Wildlife Fund	$180,000.00
Impact to Outstanding River Segments[3] (MDEP)	Four Outstanding River Segments will be impacted by forested conversion.	425 linear feet or 850 feet of river frontage (both banks)		The Grand Falls Tract, Lower Enchanted Tract, and Basin Tract, collectively offer 7.9 miles of frontage on the Dead River, an Outstanding River Segment.	Conservation recipient to be determined	7.9 miles of frontage preserved on an Outstanding River Segment
Impact to Deer Wintering Areas (DWA) (MDIFW)	Forested Conversion in the Upper Kennebec DWA	1,707,943	39.209	Preservation of 717 aces within the Upper Kennebec DWA, which is sufficiently more than the recommended 8:1, an excess of 402 acres, and at a ratio of greater than 18:1.	Conservation recipient to be determined	717 acres of Land Preservation within the Upper Kennebec DWA
				Total Additional Monetary Contributions		**$2,084,298.76**
				Total Additional Land Preservation		**1770.50 Acres**

[1] Source: MDEP Fact Sheet- In Lieu Fee Compensation Program (rev 2017).
[2] On 11/8/2018, MDIFW recommended a resource multiplier of 8 be applied to the fee calculation for each species present, where both species are present a multiplier of 16 was applied.
[3] Outstanding River Segments, as identified in 38 M.R.S. § 480-P and 12 M.R.S § 403

Table 9-5.1 ILF Compensation for Temporary Wetland Fill in Emergent Wetlands

			Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[2]			
NECEC Project Component[1]	**Total Acres of Fill**	**Resource Impact (sq. ft.)**	**County**	**Natural Resource Enhancement and Restoration Cost ($)**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission Structures	6.213	270,648	Androscoggin	3.61	0.17	$51,152.47
Transmission Structures	0.834	36,336	Cumberland	3.61	0.69	$7,812.24
Transmission Structures	2.058	89,641	Franklin	2.86	0.03	$12,953.12
Transmission Structures	0.097	4,221	Kennebec	3.61	0.16	$795.66
Transmission Structures	3.941	171,670	Lincoln	3.61	0.3	$33,561.49
Transmission Structures	0.535	23,307	Sagadahoc	3.61	0.27	$4,521.56
Transmission Structures	5.502	239,663	Somerset	3.61	0.04	$43,738.50
Total	**19.180 Acres**	**835,486 Sq. ft.**			**Total In-Lieu Fee**	**$154,535.04**

[1] Impacts are restricted to the temporary access for transmission line structures. There is no temporary wetland fill associated with substation development.

[2] Resource multiplier of 1 and an adjustment of 5%.

Table 9-5.2 ILF Compensation for Permanent Wetland Fill in SVPH

		Permanent Wetland Fill in SVPH[1]						Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[2]			
			Cowardin Cover Type (Sq. Ft.)								
NECEC Project Component	Total Acres of Fill	Resource Impact (sq. ft.)	PEM	PFO	PSS	HUC8 Watershed	Bailey and Keys Ecoregion	County	Natural Resource Enhancement and Restoration Cost ($)	Assessed Land Value ($)	In-Lieu Fee ($)
Transmission	0.001	40	0	0	40	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$302.40
Transmission	0.000	0	0	0	0	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$0.00
Transmission	0.000	0	0	0	0	NA	Western Foothills and Central Mountains	Franklin	2.86	0.03	$0.00
Transmission	0.000	0	0	0	0	NA	Central Interior	Kennebec	3.61	0.16	$0.00
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Lincoln	3.61	0.3	$0.00
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Sagadahoc	3.61	0.27	$0.00
Transmission	0.001	40	0	40	0	NA	Western Mountains	Somerset	3.61	0.04	$292.00
Merrill Road Converter	0.741	32,285	1,397	1,308	29,580	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$244,074.60
Fickett Road Substation	0.000	0	0	0	0	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
HDD Termination Stations	0.000	0	0	0	0	NA	Western Mountains	Somerset	3.61	0.04	$0.00
Total	**0.743 Acres**	**32,365 Sq. ft.**								**Total In-Lieu Fee**	**$244,669.00**

[1] Wetlands within SVPH are WOSS. For purposes of evaluating compensation, WOSS impacts shown in Exhibit 1-4 exclude WOSS associated with SVPH.

[2] Resource multiplier of 2.

Table 9-5.3 ILF Compensation for Permanent Forested Wetland Conversion in SVPH

		Permanent Wetland Conversion in SVPH						Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
			Cowardin Cover Type (Sq. Ft.)								
NECEC Project Component	Total Acres of Fill	Resource Impact (sq. ft.)[1]	PEM	PFO	PSS	HUC8 Watershed	Bailey and Keys Ecoregion	County	Natural Resource Enhancement and Restoration Cost ($)	Assessed Land Value ($)	In-Lieu Fee ($)
Transmission	0.670	29,198	0	29,198	0	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$66,221.06
Transmission	0.000	0	0	0	0	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$0.00
Transmission	1.943	84,640	0	84,640	0	NA	Western Foothills and Central Mountains	Franklin	2.86	0.03	$146,765.76
Transmission	0.000	0	0	0	0	NA	Central Interior	Kennebec	3.61	0.16	$0.00
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Lincoln	3.61	0.3	$0.00
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Sagadahoc	3.61	0.27	$0.00
Transmission	1.252	54,524	0	54,524	0	NA	Western Mountains	Somerset	3.61	0.04	$119,407.56
Merrill Road Converter	0.030	1,308	0	1,308	0	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$2,966.54
Fickett Road Substation	0.000	0	0	0	0	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
HDD Termination Stations	0.000	0	0	0	0	NA	Western Mountains	Somerset	3.61	0.04	$0.00
Total	**3.895 Acres**	**169,670 Sq. ft.**								**Total In-Lieu Fee**	**$335,360.93**

[1] Resource multiplier of 1 and a 60% adjustment.

Table 9-5.4: ILF Compensation for Permanent Upland Fill in SVPH

			Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Total Acres of Fill**	**Resource Impact (sq. ft.)**	**County**	**Natural Resource Enhancement and Restoration Cost ($)**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission Structures	0.012	537	Androscoggin	0	0.17	$91.29
Transmission Structures	0.001	60	Cumberland	0	0.69	$41.40
Transmission Structures	0.005	199	Franklin	0	0.03	$5.97
Transmission Structures	0.000	0	Kennebec	0	0.16	$0.00
Transmission Structures	0.003	119	Lincoln	0	0.3	$35.70
Transmission Structures	0.000	0	Sagadahoc	0	0.27	$0.00
Transmission Structures	0.010	437	Somerset	0	0.04	$17.48
Merrill Road Converter Station	0.689	30,018	Androscoggin	0	0.17	$5,103.06
Fickett Road Substation	0.000	0	Cumberland	0	0.69	$0.00
HDD Termination Stations	0.000	0	Somerset	0	0.04	$0.00
Total	**0.720 Acres**	**31,370 Sq. ft.**			**Total In-Lieu Fee**	**$5,294.90**

[1] Resource multiplier of 1.

Table 9-5.5: ILF Compensation for Permanent Upland Conversion in SVPH

			Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Total Acres of Conversion**	**Resource Impact (sq. ft.)**	**County**	**Natural Resource Enhancement and Restoration Cost ($)[2]**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission Structures	7.512	327,223	Androscoggin	0	0.17	$33,376.75
Transmission Structures	0.000	0	Cumberland	0	0.69	$0.00
Transmission Structures	8.765	381,802	Franklin	0	0.03	$6,872.44
Transmission Structures	0.000	0	Kennebec	0	0.16	$0.00
Transmission Structures	0.000	0	Lincoln	0	0.3	$0.00
Transmission Structures	0.000	0	Sagadahoc	0	0.27	$0.00
Transmission Structures	12.699	553,190	Somerset	0	0.04	$13,276.56
Merrill Road Converter Station	0.631	27,476	Androscoggin	0	0.17	$2,802.55
Fickett Road Substation	0.000	0	Cumberland	0	0.69	$0.00
HDD Termination Stations	0.000	0	Somerset	3.61	0.04	$0.00
Total	**29.607 Acres**	**1,289,691 Sq. ft.**			**Total In-Lieu Fee**	**$56,328.29**

[1] Resource multiplier of 1 and an adjustment of 60%.

[2] For upland portions of SVPH, no restoration cost is associated with conversion impact to non-wetland resources.

Table 9-5.6a: ILF Compensation for Direct Fill in USACE Jurisdictional Vernal Pools (Depression or 100-foot Envelope)

			Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Total Acres of Fill**	**Resource Impact (sq. ft.)**	**County**	**Natural Resource Enhancement and Restoration Cost ($)**	**Assessed Land Value ($)**	**In-Lieu Fee ($)[2]**
Transmission Structures/Station	1.392	60,640	Androscoggin	3.61	0.17	$229,219.20
Transmission Structures/Station	0.765	33,317	Cumberland	3.61	0.69	$143,263.10
Transmission Structures	0.007	297	Franklin	2.86	0.03	$858.33
Transmission Structures	0.000	0	Kennebec	3.61	0.16	$0.00
Transmission Structures	0.033	1,454	Lincoln	3.61	0.3	$5,685.14
Transmission Structures	0.001	60	Sagadahoc	3.61	0.27	$232.80
Transmission Structures/Stations	0.019	842	Somerset	3.61	0.04	$3,073.30
Total	**2.218 Acres**	**96,610 Sq. ft.**			**Total In-Lieu Fee**	**$382,331.87**

[1] Resource multiplier of 1.

Table 9-5.6b ILF Compensation for USACE High Value Jurisdictional Vernal Pools

					Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	High Value Pools (#)	Multiplier x Standard Sq Ft[2]	HUC8 Watershed	Bailey and Keys Ecoregion	County	Natural Resource Enhancement and Restoration Cost ($)	Assessed Land Value ($)	In-Lieu Fee ($)
Transmission	26	65,000	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$319,410.00
Transmission	0	65,000	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$0.00
Transmission	4	65,000	NA	Foothills and Central	Franklin	2.86	0.03	$37,570.00
Transmission	0	65,000	NA	Central Interior	Kennebec	3.61	0.16	$0.00
Transmission	4	65,000	NA	Midcoast Region	Lincoln	3.61	0.3	$50,830.00
Transmission	0	65,000	NA	Midcoast Region	Sagadahoc	3.61	0.27	$0.00
Transmission	13	65,000	NA	Western Mountains	Somerset	3.61	0.04	$154,212.50
Merrill Road Converter	2	65,000	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$24,570.00
Fickett Road Substation	0	65,000	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
Total No.	**49**						**Total In-Lieu Fee**	**$586,592.50**

[1] Resource multiplier of 1 and an adjustment of 5%.

[2] USACE 2016 Corps Mitigation Guidance: Standard of 13,000 sq.ft. x 5 for high value pools.

Table 9-5.6c ILF Compensation for USACE Medium Value Jurisdictional Vernal Pools

					Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Medium Value Pools (#)**	**Multiplier x Standard Sq Ft[2]**	**HUC8 Watershed**	**Bailey and Keys Ecoregion**	**County**	**Natural Resource Enhancement and Restoration Cost ($)**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission	55	39,000	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$405,405.00
Transmission	7	39,000	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$58,695.00
Transmission	10	39,000	NA	Foothills and Central	Franklin	2.86	0.03	$56,355.00
Transmission	1	39,000	NA	Central Interior	Kennebec	3.61	0.16	$7,351.50
Transmission	17	39,000	NA	Midcoast Region	Lincoln	3.61	0.3	$129,616.50
Transmission	9	39,000	NA	Midcoast Region	Sagadahoc	3.61	0.27	$68,094.00
Transmission	23	39,000	NA	Western Mountains	Somerset	3.61	0.04	$163,702.50
Merrill Road Converter	0	39,000	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$0.00
Fickett Road Substation	0	39,000	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
Total No.	**122**						**Total In-Lieu Fee**	**$889,219.50**

[1] Resource multiplier of 1 and an adjustment of 5%.

[2] USACE 2016 Corps Mitigation Guidance: Standard of 13,000 sq.ft. x 3 for medium value pools.

Table 9-5.6d ILF Compensation for USACE Low Value Jurisdictional Vernal Pools

					Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Low Value Pools (#)**	**Multiplier x Standard Sq Ft[2]**	**HUC8 Watershed**	**Bailey and Keys Ecoregion**	**County**	**Natural Resource Enhancement and Restoration Cost ($)**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission	29	13,000	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$71,253.00
Transmission	0	13,000	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$0.00
Transmission	11	13,000	NA	Foothills and Central	Franklin	2.86	0.03	$20,663.50
Transmission	0	13,000	NA	Central Interior	Kennebec	3.61	0.16	$0.00
Transmission	6	13,000	NA	Midcoast Region	Lincoln	3.61	0.3	$15,249.00
Transmission	0	13,000	NA	Midcoast Region	Sagadahoc	3.61	0.27	$0.00
Transmission	22	13,000	NA	Western Mountains	Somerset	3.61	0.04	$52,195.00
Merrill Road Converter	3	13,000	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$7,371.00
Fickett Road Substation	0	13,000	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
Total No.	**71**						**Total In-Lieu Fee**	**$166,731.50**

[1] Resource multiplier of 1 and an adjustment of 5%.

[2] USACE 2016 Corps Mitigation Guidance: Standard of 13,000 sq.ft. x 1 for low value pools.

Table 9-5.7 ILF Compensation for Permanent Wetland Fill in IWWH

		Permanent Wetland Fill in IWWH[1]						Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[2]			
			Cowardin Cover Type (Sq. Ft.)								
NECEC Project Component	Total Acres of Fill	Resource Impact (sq. ft.)[1]	PEM	PFO	PSS	HUC8 Watershed	Bailey and Keys Ecoregion	County	Natural Resource Enhancement and Restoration Cost ($)	Assessed Land Value ($)	In-Lieu Fee ($)
Transmission	0.000	0	0	0	0	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$0.00
Transmission	0.000	0	0	0	0	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$0.00
Transmission	0.000	0	0	0	0	NA	Western Foothills and Central Mountains	Franklin	2.86	0.03	$0.00
Transmission	0.000	0	0	0	0	NA	Central Interior	Kennebec	3.61	0.16	$0.00
Transmission	0.003	149	149	0	0	NA	Midcoast Region	Lincoln	3.61	0.3	$1,165.18
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Sagadahoc	3.61	0.27	$0.00
Transmission	0.000	0	0	0	0	NA	Western Mountains	Somerset	3.61	0.04	$0.00
Merrill Road Converter	0.000	0	0	0	0	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$0.00
Fickett Road Substation	0.000	0	0	0	0	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
HDD Termination Stations	0.000	0	0	0	0	NA	Western Mountains	Somerset	3.61	0.04	$0.00
Total	**0.003 Acres**	**149 Sq. ft.**								**Total In-Lieu Fee**	**$1,165.18**

[1] Wetlands within IWWH are WOSS. For purposes of evaluating compensation, WOSS impacts shown in Exhibit 1-4 exclude WOSS associated with IWWH.

[2] Resource multiplier of 2.

Table 9-5.8 ILF Compensation for Permanent Forested Wetland Conversion in IWWH

		Permanent Wetland Conversion in IWWH						Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
			Cowardin Cover Type (Sq. Ft.)								
NECEC Project Component	Total Acres of Fill	Resource Impact (sq. ft.)	PEM	PFO	PSS	HUC8 Watershed	Bailey and Keys Ecoregion	County	Natural Resource Enhancement and Restoration Cost ($)	Assessed Land Value ($)	In-Lieu Fee ($)
Transmission	0.000	0	0	0	0	NA	Central Maine Embayment	Androscoggin	3.61	0.17	$0.00
Transmission	0.000	0	0	0	0	NA	Presumpscot River and Casco Bay	Cumberland	3.61	0.69	$0.00
Transmission	0.590	25,705	0	25,705	0	NA	Western Foothills and Central Mountains	Franklin	2.86	0.03	$44,572.47
Transmission	0.000	0	0	0	0	NA	Central Interior	Kennebec	3.61	0.16	$0.00
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Lincoln	3.61	0.3	$0.00
Transmission	0.000	0	0	0	0	NA	Midcoast Region	Sagadahoc	3.61	0.27	$0.00
Transmission	2.032	88,527	0	88,527	0	NA	Western Mountains	Somerset	3.61	0.04	$193,874.13
Merrill Road Converter	0.000	0	0	0	0	Lower Androscoggin River	Central Maine Embayment	Androscoggin	3.61	0.17	$0.00
Fickett Road Substation	0.000	0	0	0	0	Presumpscot River and Casco Bay	Casco Bay Coast	Cumberland	3.61	0.69	$0.00
HDD Termination Stations	0.000	0	0	0	0	NA	Western Mountains	Somerset	3.61	0.04	$0.00
Total	**2.622 Acres**	**114,232 Sq. ft.**								**Total In-Lieu Fee**	**$238,446.60**

[1] Resource multiplier of 1 and an adjustment of 60%.

Table 9-5.9: ILF Compensation for Permanent Upland Fill in IWWH

			Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Total Acres of Fill**	**Resource Impact (sq. ft.)**	**County**	**Natural Resource Enhancement and Restoration Cost ($)**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission Structures	0.005	199	Androscoggin	0	0.17	$33.83
Transmission Structures	0.000	0	Cumberland	0	0.69	$0.00
Transmission Structures	0.002	79	Franklin	0	0.03	$2.37
Transmission Structures	0.000	0	Kennebec	0	0.16	$0.00
Transmission Structures	0.001	30	Lincoln	0	0.3	$9.00
Transmission Structures	0.000	0	Sagadahoc	0	0.27	$0.00
Transmission Structures	0.007	290	Somerset	0	0.04	$11.60
Merrill Road Converter Station	0.000	0	Androscoggin	0	0.17	$0.00
Fickett Road Substation	0.000	0	Cumberland	0	0.69	$0.00
HDD Termination Stations	0.000	0	Somerset	0	0.04	$0.00
Total	**0.014 Acres**	**598 Sq. ft.**			**Total In-Lieu Fee**	**$56.80**

[1] Resource multiplier of 1.

Table 9-5.10: ILF Compensation for Permanent Upland Conversion in IWWH

			Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier)[1]			
NECEC Project Component	**Total Acres of Conversion**	**Resource Impact (sq. ft.)**	**County**	**Natural Resource Enhancement and Restoration Cost ($)[2]**	**Assessed Land Value ($)**	**In-Lieu Fee ($)**
Transmission Structures	0.387	16,877	Androscoggin	0	0.17	$1,721.45
Transmission Structures	0.000	0	Cumberland	0	0.69	$0.00
Transmission Structures	2.226	96,966	Franklin	0	0.03	$1,745.39
Transmission Structures	0.000	0	Kennebec	0	0.16	$0.00
Transmission Structures	0.000	0	Lincoln	0	0.3	$0.00
Transmission Structures	0.000	0	Sagadahoc	0	0.27	$0.00
Transmission Structures	9.773	425,713	Somerset	0	0.04	$10,217.11
Merrill Road Converter Station	0.000	0	Androscoggin	0	0.17	$0.00
Fickett Road Substation	0.000	0	Cumberland	0	0.69	$0.00
HDD Termination Stations	0.000	0	Somerset	0	0.04	$0.00
Total	**12.387 Acres**	**539,556 Sq. ft.**			**Total In-Lieu Fee**	**$13,683.95**

[1] Resource multiplier of 1 and an adjustment of 60%.

[2] For upland portions of IWWH, no restoration cost is associated with conversion impact to non-wetland resources.

Table 9-5.11: Compensation for Conversion in Unique Natural Communities

			Assessed Land Value x Resource Multiplier[1]			
NECEC Project Component	Total Acres of Conversion with 250' Directional Buffer [2]	Resource Impact (sq. ft.)	County	Natural Resource Enhancement and Restoration Cost ($)	Assessed Land Value ($)	In-Lieu Fee ($)
Transmission Structures	0.000	0	Androscoggin	0	0.17	$0.00
Transmission Structures	0.000	0	Cumberland	0	0.69	$0.00
Transmission Structures	0.000	0	Franklin	0	0.03	$0.00
Transmission Structures	0.000	0	Kennebec	0	0.16	$0.00
Transmission Structures	0.000	0	Lincoln	0	0.3	$0.00
Transmission Structures	0.000	0	Sagadahoc	0	0.27	$0.00
Transmission Structures	87.848	3,826,646	Somerset	0	0.04	$1,224,526.82
Merrill Road Converter Station	0.000	0	Androscoggin	0	0.17	$0.00
Fickett Road Substation	0.000	0	Cumberland	0	0.69	$0.00
HDD Termination Stations	0.000	0	Somerset	0	0.04	$0.00
Total	**87.848 Acres**	**3,826,646 Sq. Ft.**			**Total In-Lieu Fee**	**$1,224,526.82**

[1] Resource multiplier of 8.

[2] Permanent conversion impact to MNAP natural communities is 9.229 acres (402,008 sq.ft.). MNAP determined that it was appropriate to apply a 250' buffer in considering the area of which compensation would be provided. MNAP defined the 250' directional buffers for each occurrence, which totals the impact area presented in this table.

Table 9-5.12 Compensation for Conversion in Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas

Township	County	Stream Name	Feature ID	Surveyed? (Y/N)	Species Present[1]	Clearing Impact within the Management Areas[2] (ac)	Clearing Impact (sq ft)	Assessed Land Value ($/sq ft)[3]	Resource Multiplier Applied to Fee[4]	Calculated Fee
Skinner Twp	Franklin	S. Branch Moose River	PSTR-09-11	Y	RBM	1.84	80,107	0.03	8	$19,225.64
Skinner Twp	Franklin	Trib to Bog Brook	PSTR-11-01	Y	NSS	2.75	119,659	0.03	8	$28,718.24
Appleton Twp	Somerset	Trib to Bog Brook	PSTR-12-07	Y	NSS	1.90	82,590	0.04	8	$26,428.72
Appleton Twp	Somerset	Gold Brook	PSTR-15-06	Y	RBM/NSS					
Appleton TWP	Somerset	Trib. to Gold Brook	PSTR-16-07	N	RBM/NSS					n/a, mitigation being proposed[5]
Appleton TWP	Somerset	Trib. to Gold Brook	PSTR-16-10	N	RBM/NSS					
Appleton TWP	Somerset	Trib. to Gold Brook	PSTR-16-15	N	RBM/NSS					
Appleton Twp	Somerset	Baker Stream	PSTR-17-07	Y	NSS	3.10	135,036	0.04	8	$43,211.52
Appleton Twp	Somerset	Baker Stream	PSTR-17R-04	Y	NSS					
Bradstreet TWP	Somerset	Unnamed Stream	PSTR-24-02	N	RBM/NSS	0.06	2,788	0.04	16	$1,784.22
Bradstreet TWP	Somerset	Trib. to Horse Brook	PSTR-26-05	N	RBM/NSS	1.32	57,456	0.04	16	$36,771.61
Johnson Mtn TWP	Somerset	Mountain Brook	PSTR-33-01	Y	RBM/NSS					
Johnson Mtn TWP	Somerset	Mountain Brook	PSTR-EM-34-01	Y	RBM/NSS					n/a, mitigation being proposed[5]
Johnson Mtn TWP	Somerset	Trib to Mountain Brook	PSTR-EM-34-02	Y	RBM/NSS					
Johnson Mtn TWP	Somerset	Trib. To East Branch Salmon Stream	PSTR-38-02	Y	NSS	4.30	187,308	0.04	8	$59,938.56
Johnson Mtn TWP	Somerset	Trib. To East Branch Salmon Stream	PSTR-38-06	Y	NSS					
Johnson Mtn TWP	Somerset	Trib. To East Branch Salmon Stream	PSTR-38-10	Y	NSS	2.25	97,792	0.04	8	$31,293.50
Johnson Mtn TWP	Somerset	Trib. To East Branch Salmon Stream	PSTR-38-15	Y	NSS	1.86	80,891	0.04	8	$25,885.09
Johnson Mtn TWP	Somerset	Trib. to Cold Stream	PSTR-40-07	N	RBM/NSS	4.08	177,855	0.04	16	$113,827.51
Johnson Mtn TWP	Somerset	Trib. to Cold Stream	PSTR-41-04	N	RBM/NSS					
Bradstreet TWP	Somerset	Trib to Piel Brook	PSTR-SRD1-02	N	RBM/NSS	1.48	64,599	0.04	16	$41,343.67
Bradstreet TWP	Somerset	Unnamed Stream	PSTR-SRD1-28-02	N	RBM/NSS	1.48	64,599	0.04	16	$41,343.67
Bradstreet TWP	Somerset	Unnamed Stream	PSTR-SRD1-28-05	N	RBM/NSS					
					Total Impact	**26.416 Acres**	**1,150,681 Sq. ft.**		**Total Fee**	**$469,771.95**

[1] For those streams outside of CMP's ownership and on lands which permission to survey was not granted from landowners, and unless the waterbody is hydrologically connected to another stream which presence/absence surveys were conducted, the presence of both species is assumed.

[2] The clearing impact includes the area extending 250 feet on both sides of the stream channel. The management areas were mapped according to "Notes on Mapping Protocol for Roaring Brook Mayfly Habitat Polygons in ETSC (12/22/10)" provided by MDIFW. This mapping protocol was applied to RBB and NSS waterbodies, as recommended by MDIFW. Where mapped management area polygons overlapped, the impact area was combined.

[3] Source: MDEP Fact Sheet- In Lieu Fee Compensation Program (rev 2017).

[4] On 11/8/2018, MDIFW recommended a resource multiplier of 8 be applied to the fee calculation for each species present, where both species are present a multiplier of 16 was applied.

[5] CMP will retain full height vegetation in the CMA's for these resources.

9-6: NECEC Proposed Criteria for USACOE Vernal Pools Values Determination for Compensation Plan Development- May 2018

New England Clean Energy Connect (NECEC)
Proposed Criteria for USACOE Vernal Pools Values Determination for Compensation Plan Development
May 2018

High Value

- Significant Vernal Pools (SVPs), as defined in Maine Natural Resource Protection Act (NRPA), Significant Vernal Pool definition according to Significant Wildlife Habitat Rules (Significant Wildlife Habitat 06-096 Chapter 335 Section 9) or Potentially Significant Vernal Pools (PSVPs) using these same criteria.
- Artificial pools which meet NRPA Significance criteria.
- Cluster/complexes of pools (pools whose depressions are within 1000 feet of one or more other surveyed vernal pools, and where there are no substantial travel barriers (i.e. streams or rivers greater than 25 feet wide; roads classified as principal arterials, minor arterials, and major/urban collectors)between pools.
- Pools with blue spotted salamander (at any life stage) or other state/federal listed rare, threatened or endangered (RTE) species, regardless of abundance.

Medium Value

- Natural or artificial pools whose indicator species abundance does not meet NRPA Significance criteria, but where 2 or more indicator species are present which approach abundance criteria (≥ 75% of NRPA abundance criteria), and/or where RTE species are present.

Low Value

- ATV/Skidder ruts/ABA/Spawning areas which do not meet NRPA significance criteria and which have low indicator species abundance and no RTE species.
- Pools having seasonal or temporary inlets/outlets with evidence of predatory fish.
- Pools whose 750 foot critical terrestrial habitat (CTH) is not comprised of at least 75% suitable forested conditions.

No compensation required (if surveyed feature meets any of these criteria)

- Presence of predatory fish with a permanent inlet/outlet.
- At least 75% forested cover type is retained in the CTH following construction and no fill occurs within the pool depression or 100-foot envelope.
- Where directional buffers are used to maintain a minimum of 75% of the CTH in a forested condition.
- Pools previously compensated for under another permit.
- ATV/Skidder ruts in active areas which experience repeated seasonal disturbance (e.g. club maintained or licensed ATV trail).
- Existing, ongoing human disturbance within the pool depression or within the 100 foot envelope (e.g. unauthorized fill, dumping, or existing polluted condition).

DRAFT

9-7: Position Paper on the Presence of Significant Vernal Pools in or Adjacent to Transmission Line Corridors, TRC Engineers, LLC, March 2009.

Position Paper on the Presence of Significant Vernal Pools in or Adjacent to Transmission Line Corridors in Maine

Prepared by:

TRC Engineers, LLC

Prepared for:

Central Maine Power Company

March 2009

Executive Summary

Central Maine Power Company (CMP), in support of its proposed Maine Power Reliability Program (MPRP), conducted extensive vernal pool mapping and assessment surveys along approximately 620 miles of CMP transmission corridor during the springs of 2007 and 2008. These surveys were performed in accordance with an agency-approved protocol and were consistent with the requirements and timeframes presented in the State of Maine Natural Resources Protection Act (NRPA) Chapter 335 – Significant Wildlife Habitat Rules. Central Maine Power documented 200 natural vernal pools and 689 anthropogenic pools within or adjacent to proposed MPRP transmission corridors. *Rana sylvatica*, *Ambystoma maculatum*, *Ambystoma laterale*, and *Eubranchipus sp*. or egg masses of these species were observed in these pools. Of the natural vernal pools, 88 (45 percent) qualified as significant vernal pools under Chapter 335. All of these significant vernal pools were located within, or adjacent to, transmission corridors that have been maintained in an early-successional shrub habitat for 40 years or more. In addition, 48 (56 percent) of these significant vernal pools' critical terrestrial habitat was 51 to 75 percent non-forested. In sum, fully 87.5 percent of the identified significant vernal pools had less than 75 percent forested habitat within their critical terrestrial habitat. Most of the non-forested land use within 250 feet of significant vernal pools was transmission corridor. Habitat conditions permeable to amphibian migration, including the presence of leaf litter, coarse woody debris, mammal burrows, dense herbaceous and shrub vegetation cover, were all observed in transmission corridors.

Based on the results of CMP's investigation, no measurable loss of vernal pool functions is apparent in and along electric utility transmission corridors; in fact, significant vernal pools remain abundant and highly productive in the typical scrub/shrub habitat found in most transmission line corridors, even after multiple decades. Data suggest the very different impacts from "hard" land uses (e.g., paved/commercial development) and "soft" land uses (e.g., transmission line maintenance). Given these results, design, location, and construction strategies should focus on maintaining existing vernal pool functions within transmission line corridors. In-lieu fee or preservation type compensatory mitigation strategies are more appropriate where significant natural resource impacts (i.e., functional loss) occurs, and are thus not appropriate in these situations. As an alternative to compensatory mitigation, research to further evaluate best management practices for vernal pool conservation along transmission corridors, may be appropriate.

1.0 INTRODUCTION

Central Maine Power Company (CMP) is currently proposing to bolster the long-term reliability of its bulk power electrical transmission system through a project known as the Maine Power Reliability Program (MPRP). As part of this process, CMP is proposing a number of transmission line and substation improvements to add reliability and redundancy to its aging 345 kilovolt (kV) and 115 kV transmission system. A component of this overall proposal is the consideration of potential impacts to various natural resources, including significant vernal pools. In order to document and evaluate the potential effects of the MPRP on significant vernal pools, CMP initiated an unprecedented effort in Maine during the springs of 2007 and 2008 to assess and map vernal pool resources within, and in the vicinity of, a number of existing transmission line corridors and substation sites. TRC Engineering (TRC) was hired to manage and perform this vernal pool resource assessment and mapping effort. In total, TRC surveyed over 620 miles of existing CMP transmission corridor and associated substation sites (both newly proposed substations and substation expansions) for the presence of vernal pool resources. CMP's vernal pool investigation resulted in one of the largest vernal pool datasets in the State of Maine. Figure 1 depicts the vernal pool survey area contrasted with the biophysical regions of Maine.

This position paper first identifies issues relevant to vernal pool conservation, regulation, and management along transmission corridors in Maine based on existing regulations and published best management practices. This is followed by a description of CMP's methods of vernal pool investigation, and a discussion of the results of CMP's investigation relative to existing knowledge of vernal pool ecology. In the final section of this paper, the findings of this vernal pool investigation are summarized, and recommendations are made regarding significant vernal pool management and regulation in transmission corridors.

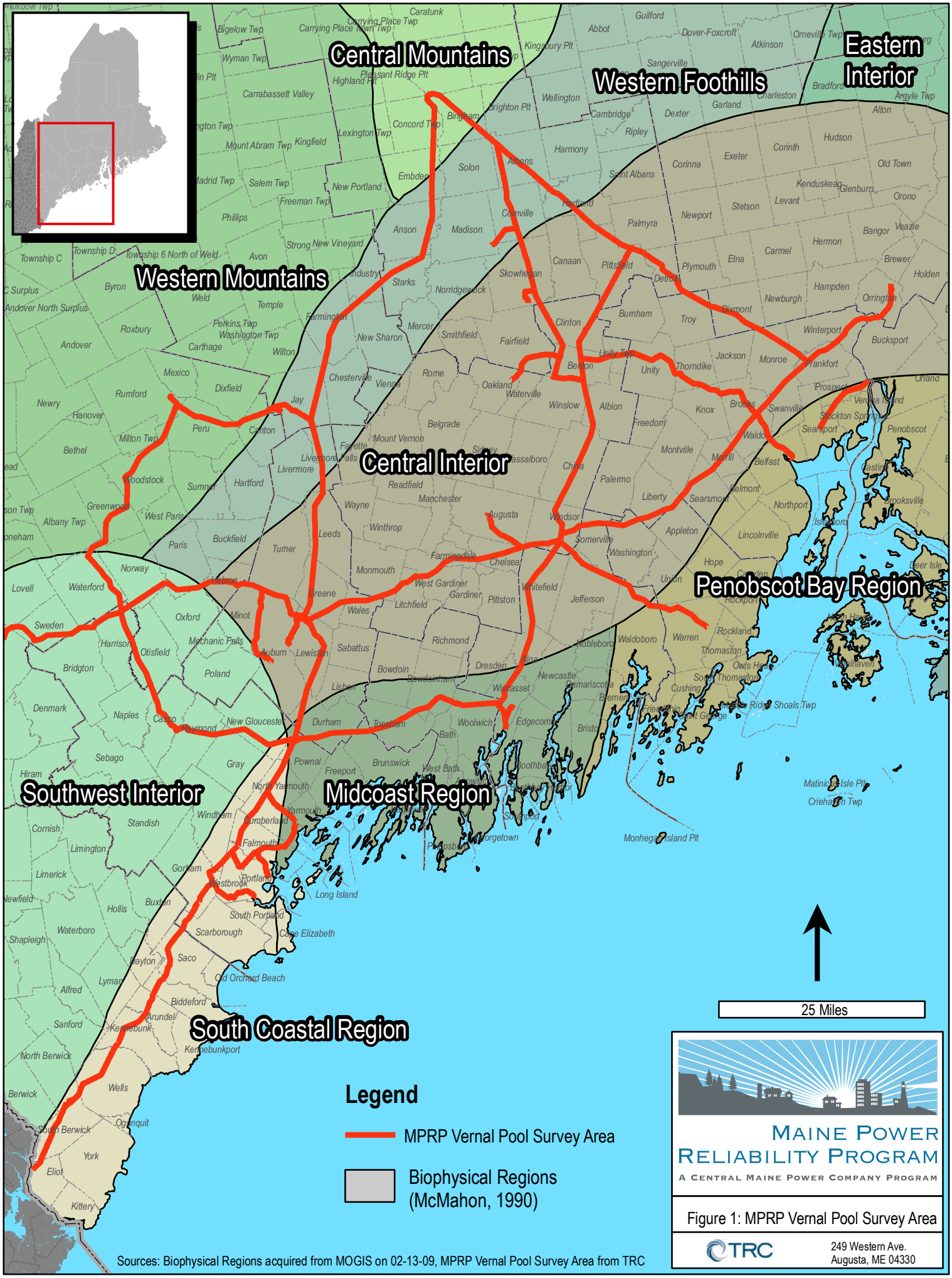


Figure 1: MPRP Vernal Pool Survey Area

2.0 ISSUE IDENTIFICATION

In the glaciated northeast, vernal pools are temporary to semi-permanent pools that are located in shallow depressions on the landscape, and that lack permanent hydrologic inlets or outlets and populations of predatory fish (Calhoun and deMaynadier, 2008). Vernal pools provide the primary breeding habitat for several amphibian species (DeGraff and Yamasaki, 2001), as well as other obligate vernal pool species. *Rana sylvatica* (wood frogs), *Ambystoma maculatum* (spotted salamanders), and *Ambystoma laterale* (blue spotted salamanders) spend most of their life cycles in upland or wetland habitats surrounding vernal pools, and migrate to vernal pools for a short part of the year during the spring breeding season (Semlitsch, 2000). Thus, although vernal pools are often small hydrologically isolated wetlands, they share a significant ecological connection to the surrounding landscape.

Regulatory protection is provided to certain vernal pools in Maine by the U.S. Army Corps of Engineers (USACE) under § 404 of the Clean Water Act (33 U.S.C. § 1344) and by the Maine Department of Environmental Protection (MDEP) under the Natural Resources Protection Act. Some municipalities in Maine also regulate impacts to vernal pools in their evaluation of proposed developments (e.g., Town of Falmouth, 2009). In recognition of the ecological connection between vernal pools and the adjacent landscape, federal and state regulations also exert jurisdiction over uplands and wetlands adjacent to vernal pools. Given that vernal pools occur broadly across the landscape in the glaciated northeast (Rheindhardt and Hollands, 2008), vernal pool regulations have significant implications for linear transmission corridor construction, because vernal pools are almost certain to be crossed by transmission corridors which span long distances across the landscape.

Projects reviewed by the USACE, pursuant to the Department of the Army Programmatic General Permit - State of Maine (MEPGP) are evaluated for project impacts within 500 feet of jurisdictional vernal pools. Larger projects being permitted by the USACE may also require review by the U.S. Fish and Wildlife Service (USFWS), which evaluates project impacts within 750 feet of vernal pools. Under NRPA, the MDEP exerts jurisdiction over “significant vernal pool habitat” as one type of regulated “significant wildlife habitat,” which includes significant vernal pools and land within 250 feet of significant vernal pool depressions. Vernal pools qualify as “significant” based on the presence of certain species known to utilize vernal pools for a critical part of their life phase, or by the abundance of egg masses deposited by certain amphibian species (06 096 C.M.R. Ch. 335 § 9(B)). The MDEP does not have jurisdiction over “non-significant” vernal pools. Both federal and state regulations require that applicants attempt to avoid and minimize impacts to these habitats to the greatest extent practicable, and, in some cases, to provide compensation.

Although not a regulatory requirement, some researchers/authors of current best development practices (guidance for avoiding and minimizing effects) for vernal pool

management recommend no impact to the vernal pool depression and minimal disturbance to the habitat within 100 feet of the pool, and maintenance of 75% of the habitat from 100 to 750 feet of the pool as contiguous forest with undisturbed ground cover (Calhoun and Klemens, 2002). These guidelines identify the habitat from 100 to 750 feet of the pool as the "critical terrestrial habitat" for pool breeding amphibians. Chapter 335 of MDEP's rules defines significant vernal pool habitat as a significant vernal pool depression and that portion of the critical terrestrial habitat within 250 feet of the high water mark of the pool depression.

Due to a lack of published research evaluating vernal pool conservation strategies, the vernal pool best development practices were developed based primarily on years of field observations regarding the effect of land development on pool breeding wildlife populations, (Calhoun and Klemens, 2002). Two recent case studies have demonstrated that residential and commercial development around vernal pools can cause precipitous declines or collapse of vernal pool breeding amphibians (Windmiller et al., 2008). The existing best development practices were based on the limited research regarding vernal pool conservation strategies that was available at the time of their publication, and they should be considered as provisional best-attempts that may need to be modified to meet local or site specific conservation needs (Windmiller and Calhoun, 2008). Despite the provisional nature of these guidelines, the current regulatory standards in the NRPA are predicated on the Calhoun and Klemens (2002) best development practices, and utilize a universal (i.e., "one size fits all") approach to vernal pool conservation, which may not be appropriate to all classes of land use, or optimal for vernal pool conservation and management.

It is also essential to recognize that the existing best development guidelines regarding conservation strategies for vernal pools are specific to three principal land use classes: residential, commercial, and forest management. The Calhoun and Klemens (2002) best development practice recommendations were designed specifically with respect to "hard" land uses (i.e., clearing, grubbing, grading and paving), including commercial and residential development that result in effectively irreversible and permanent habitat loss. More recent case studies evaluating the effect of land use on vernal pool populations also focus on residential and commercial development (Windmiller et al., 2008). However, "soft" land uses, such as forestry operations or transmission corridor construction, where alteration of habitat via removal of large trees (but not necessarily loss of all vegetation or habitat) occurs, warrants a different set of management guidelines. For example, habitat management guidelines for forestry operations have already been developed, and recommend leaving an undisturbed protection zone immediately adjacent to vernal pools, selected harvesting in a larger radius around vernal pools to maintain some shade and canopy cover, and maintaining uncompacted leaf litter and coarse woody debris on the forest floor (Calhoun and deMaynadier, 2004; deMaynadier and Houlahan, 2008). As with the best development guidelines for residential and commercial development, these habitat management guidelines for forestry operations are preliminary and further research is needed to confirm their effectiveness (deMaynadier and Houlahan, 2008). Very little research or published information exists on the effect of transmission corridor construction and maintenance on vernal pools in the glaciated northeast, and no best

development guidelines for transmission corridors relative to vernal pools have been published.

The lack of data regarding whether transmission corridor construction and maintenance adversely affects vernal pool populations is important to recognize, because the effect of transmission corridors on significant vernal pool habitats is markedly different than that of residential and commercial development, or even forestry operations. Transmission corridor construction through forested areas affects habitat principally via the conversion of forest to shrub and herbaceous cover types, and the presence of utility structures that have a minimal footprint. Paved surfaces, permanent roads, lawns, and buildings characteristic of hard forms of development are not necessary for transmission corridor construction and maintenance. Thus, the habitat and landscape conditions that are required to support significant vernal pools (such as shade, woody debris/organic litter, moisture, suitable non-breeding season habitat, and amphibian migration routes) are all maintained along transmission corridors.

Applying Maine's existing NRPA significant vernal pool regulatory and compensatory mitigation framework to transmission corridor construction does not appear to be justified based on the current and evolving knowledge of the effects of transmission line corridors on vernal pools and vernal pool conservation strategies. There is currently no published data documenting that transmission corridors cause a loss or degradation of vernal pool ecological functions.

As will be discussed below, recent scientific observations during CMP's 2007-08 vernal pool investigations indicate that many of the vernal pools occurring in or adjacent to transmission corridors were documented as significant vernal pools as described in Chapter 335. In the absence of previously published data on the occurrence of vernal pools in managed electric transmission corridors, these recent CMP data are particularly useful in evaluating the impact of long-established transmission line corridors on vernal pools.

3.0 METHOD OF INVESTIGATION

TRC completed vernal pool surveys along existing transmission corridors associated with the MPRP. Many of these corridors have been managed as electric transmission corridors for over 40 years. These surveys were located in the South Coastal, Midcoast, Penobscot Bay, Central Interior, Western Foothill, and Western Mountain biophysical regions of Maine (see Figure 1). The objectives of the vernal pool surveys were to identify potential vernal pools within the program area; to determine if the identified pools were being used by obligate pool species; to determine if any of the pools met the criteria for designation as significant vernal pool habitat in accordance with NRPA standards; and to determine U.S. Army Corps jurisdiction under Section 404 of the Clean Water Act.

Under NRPA regulatory standards (06 096 C.M.R. Ch. 335 § 9(B)) significant vernal pools are defined by either: (1) the abundance criteria, which requires surveying the number of amphibian egg masses belonging to certain species and the presence of fairy shrimp in any life stage; or (2) the rarity criteria, which looks to the documented use of a vernal pool by one or more state-listed threatened (T) or endangered (E) species that commonly require a vernal pool to complete a critical life stage. The specific egg mass abundance criteria that are necessary for a vernal pool to be considered significant include:

Species	Abundance Criteria
Blue spotted salamanders	Presence of 10 or more egg masses[1]
Spotted salamanders	Presence of 20 or more egg masses
Wood frogs	Presence of 40 or more egg masses

In Maine, state-listed threatened or endangered species known to use vernal pools for at least one critical life stage include the following:

Species	Listing	Life Stage(s)
Ringed Boghaunter (dragonfly)	Endangered	Egg laying, Larval Development, Larval Emergence
Spotted Turtle	Threatened	Foraging, Courtship, Mating
Blanding's Turtle	Endangered	Foraging, Hibernation
Ribbon Snake	Special Concern	Foraging
Wood Turtle	Special Concern	Foraging

Thus, field investigations focused on identification and tally of amphibian egg masses, identification of fairy shrimp, identification of threatened and endangered species, and wood frog chorusing surveys. Vernal pool and adjacent habitat characteristics were recorded. Evidence of anthropogenic alteration to the identified vernal pools was also

[1] An egg mass is defined as three or more individuals eggs clumped in a gelatinous matrix (06 096 C.M.R. Ch. 335 § 9(B)(4).)

documented. Pools that were created by anthropogenic activities, such as flooded ATV ruts surrounded by soils that were not flooded, were noted as "amphibian breeding areas" in order to distinguish them from non-significant natural vernal pools and significant natural vernal pools.

The timing of vernal pool surveys was also an important consideration. Vernal pool surveys were timed to coincide with the portion of the year when they are used by amphibians and invertebrates for breeding or aquatic phases of their lifecycle. Southern and coastal areas were surveyed first, followed by the western and northern portions of the study area. Egg mass surveys were conducted within the following regional timeframes suggested by the MDEP:

Geographic Region[2]	Wood Frogs	Spotted and Blue Spotted Salamanders
Northern Maine	May 1 – May 21	May 10 – May 31
Southern Maine	April 7 – April 21	April 20 – May 21

Field surveys were conducted by teams of two biologists experienced with evaluation of vernal pools of New England. Each team was responsible for documenting observations on a vernal pool data form that had previously been approved by Maine regulatory agencies. The field teams walked along study corridors to identify and assess new vernal pools, as well as to evaluate any potential vernal pools that had been previously identified from existing information. In general, each field team "meandered" within the study corridor to thoroughly assess the corridor and minimize the chances of any vernal pools (both in and outside of the study corridor) being missed.

To be consistent with NRPA protocol requirements and recommendations, amphibian egg mass surveys were conducted under appropriate field conditions and within the recommended daily timeframes for such survey efforts. To the extent possible, egg mass surveys were conducted during the day when the sun was out (typically between 9 am - 4 pm). Polarized sunglasses were generally used to minimize sun glare and to aid in the detection of egg masses. Two biologists conducted surveys beginning from separate ends of each pool and thoroughly searched the entire pool together, including the pool center, to ensure that all egg masses were counted. In order to reduce the possibility of errors or omissions in field observations, field biologist teams collaborated to observe, identify, and count egg masses. When agreement was reached regarding the number and types of egg masses that were present within an individual pool, the field team documented findings on the data form and took photographs. In order to prevent disturbance of breeding amphibians and egg masses, biologists entered and stayed within the pools only long enough to collect the necessary data for vernal pool evaluation, and were careful not to dislodge egg masses from attachment sites.

Wood frog chorusing surveys and fairy shrimp surveys were also completed concurrently with amphibian egg mass surveys. Chorusing wood frogs were noted and used to

[2] The northern Maine region is considered to be that part of the state north of a line extending from Fryeburg to Auburn to Skowhegan to Calais. The southern Maine region is the part of the state south of that same line (06 096 C.M.R. Ch. 335 § 9(B)(4)).

evaluate whether additional breeding activity could be anticipated within nearby pools and, hence, whether the pools should be revisited at a later date when breeding activity was completed for the season. Fairy shrimp were identified using dip nets, and direct visual observation of fairy shrimp within the water column. View tubes were also occasionally used. Biologists carefully searched sunny patches in the pool, as fairy shrimp often congregate in these areas.

A Geographic Information System (GIS) analysis of land use within the 250 foot critical terrestrial habitat of identified significant vernal pools was completed subsequent to field surveys. Based on aerial photo interpretation and the transmission right-of-way (ROW) boundary, land use was classified into forested and non-forested cover types occurring within and outside of the ROW boundary. Non-forested cover types included scrub-shrub transmission corridor, hayfields, croplands, and developed areas such as roads, houses, and lawns.

4.0 RESULTS AND DISCUSSION

Vernal pools were found to be abundant within and immediately adjacent to CMP's transmission corridors. CMP identified 88 significant vernal pools, 112 non-significant natural vernal pools, and 689 anthropogenically altered or created amphibian breeding areas (Table 1). Thus, of the vernal pools that were identified, 44 percent met the NRPA criteria for significant vernal pools. According to the Maine Department of Inland Fisheries and Wildlife (MDIF&W statement at a Maine Association of Wetland Scientists vernal pool workshop on February 6, 2009), that agency maintains a database of 230 natural vernal pools of which 63 (27 percent) are significant vernal pools. At a February 2009 professional workshop addressing vernal pool protection and management in Maine, agency officials stated that approximately 40 to 50 percent of the natural vernal pools on the landscape were expected to meet the Chapter 335 Significant Wildlife Habitat Rules vernal pool significance criteria. The occurrence of significant natural vernal pools along the transmission corridors surveyed as part of the MPRP (44 percent) falls in the middle of that 40 to 50 range and compares well with regulatory expectations. In addition, the occurrence ratio of significant vernal pools to all natural vernal pools within and along CMP's transmission corridors (88/200 = 44 percent) is higher than that of the existing MDIF&W vernal pool database (63/230 = 27 percent)

Spotted salamanders, blue spotted salamanders, and wood frogs were among the identified amphibians or amphibian egg masses. Fairy shrimp were also identified in a very limited number of pools. Other than the occurrence of fairy shrimp, no threatened or endangered species were observed within 250 feet of any vernal pools. This dataset is one of the largest vernal pool databases within the State of Maine.

The 689 identified amphibian breeding areas were comprised of pools created by human activities, but that were used by obligate pool breeding amphibians. Amphibian breeding areas were primarily all terrain vehicle (ATV) ruts located in wetlands or uplands, but other types of amphibian breeding areas such as farm ponds were also documented. Vernal pools created by human activities can often serve as ecological traps with insufficient hydroperiods, but some anthropogenic pools may have adequate hydroperiods for breeding success (DiMauro and Hunter, 2002). The ecological function of anthropogenically created amphibian breeding areas along transmission corridors is probably variable, and at this time their suitability as viable vernal pool habitat is unproven.

Table 1 Summary of Vernal Pools Identified Along the MPRP Survey Corridor

Approximate Survey Mileage	Significant Natural Vernal Pools	Non-Significant Natural Vernal Pools	Anthropogenically Altered/Created Amphibian Breeding Areas
620	88	112	689

Among the 88 pools that qualify as significant vernal pools under NRPA standards, 77 have non-forested cover types exceeding 25 percent of their critical terrestrial habitat (within 250 feet of the pool) (Table 2). The average non-forested coverage within 250 feet of significant vernal pools was 44 percent, with a range of 14 to 86 percent non-forested coverage (Table 3). Of these significant vernal pools, 50 currently have 26 to 50 percent non-forested cover types within 250 feet of the pool (Table 2), and 26 have 51 to 75 percent non-forested cover types. Land use within 250 feet of significant vernal pools included utility corridor, forest, agricultural land, and "hard" land uses such as roads, parking lots, houses/subdivisions, and lawns. Existing transmission corridors accounted for the vast majority of non-forested cover types within 250 feet of significant vernal pools. Of note, 87.5 percent of significant vernal pools within the surveyed corridors contained less than 25 percent forested cover types within their critical terrestrial habitat (within 250 feet of the pool depression).

The transmission corridors that the pools are located within or along have been in existence and managed as non-forested, early-successional habitat for nearly half a century or more (Table 2). These data suggest that conversion of forest cover types to utility corridor can support and maintain viable and healthy populations of vernal pool breeding amphibians, even after time periods spanning multiple amphibian generations. However, despite what appears to be robust populations of pool breeding amphibians and abundant pool breeding habitat along transmission corridors in Maine, NRPA standards suggest that existing transmission corridors that have existed for multiple decades may need to be counted toward the 25% non-forested habitat threshold beyond which mitigation is required.

Table 2: Significant Vernal Pool Buffer Habitat Characteristics Along the Survey Corridor

Total Number of Significant Vernal Pools	Approximate Age Range of Existing Utility Corridor (years)	Existing Non-Forested Habitat Cover Within 250 Feet of Significant Vernal Pools							
		< 25%		26-50%		51-75%		76% - 100%	
		n	%	n	%	n	%	n	%
88	40 to 60 plus	11	12.5	50	56.8	26	29.5	1	1

The documented abundance of significant vernal pools and associated wildlife occurrences within the surveyed CMP corridors suggests that the habitat conditions necessary to supporting vernal pool populations are maintained along transmission corridors. This is despite the removal of trees that are required to construct and maintain transmission line corridors in a safe and reliable condition. Among these habitat conditions are sufficient pool hydroperiods (Skidds and Golet, 2005), organic carbon inputs to vernal pool depressions via leaf litter and herbaceous vegetation, landscapes that are permeable to amphibian migration (Calhoun and Klemens, 2002), and suitable non-breeding season habitat (Semlitsch, 2000).

Table 3: Non-Forested Habitat Cover Within 250 Feet of Significant Vernal Pools

Number of Pools	Mean	Range
88	44%	14% to 86%

Hydroperiod, an essential element of amphibian breeding success, requires that suitable breeding habitat containing vernal pools must hold water long enough for amphibian larvae to complete their aquatic life phase (Skidds and Golet, 2005). Soil disturbance, harvest road construction, and tree removal are three activities that have been noted as having the potential to affect pool hydroperiod in managed forests (deMaynadier and Houlahan, 2008). While tree removal activities occur during transmission corridor construction, there are significant differences in their implementation relative to forestry operations. The primary differences and similarities between transmission line corridor establishment and forestry operations are summarized below.

During transmission corridor construction, soil disturbance is minimized by the use of erosion and sediment control measures, routine environmental inspections by utility representatives and consultants, third party environmental inspections, and the use of construction mats in wet areas to prevent soil rutting and compaction. Conversely, these practices are generally neither followed nor required in forest management operations. Permanent harvest roads that can alter local surface drainage patterns are common on managed woodlands. Permanent harvest roads are not constructed within transmission corridors. In addition, on transmission corridor projects, initial tree removal is completed in a relatively rapid, one-time effort. In contrast, soils in managed woodlands are often disturbed by the repeated passage of heavy equipment over time, during one or more forest harvests.

Furthermore, forest harvesting has not been proven to produce long-term effects on seasonal forest pool hydroperiod based on chronosequence investigations (Batzer et al., 2000; Palik et al., 2001). Higher groundwater tables have been documented following harvesting (Sun et al., 2000), suggesting that tree removal will not shorten pool hydroperiod. Other work has revealed only subtle effects on local water tables outside of the immediate post-harvest time period (Bliss and Comerford, 2002). These findings suggest that tree removal related to transmission corridor construction will not have any significant long-term effect on vernal pool hydroperiods.

That vernal pools and evidence of pool breeding wildlife populations were common along existing transmission corridors during 2007 and 2008 vernal pool assessment surveys demonstrates that the hydroperiod of many transmission corridor vernal pools is sufficient for pool breeding amphibians to complete their aquatic life phase. In the glaciated northeast, factors such as surficial geologic setting, landscape position, geomorphic setting, and catchment size may very well be more relevant to vernal pool hydroperiod within transmission corridors than tree removal and other activities related to transmission corridor construction.

Importation of leaves, woody debris, and other organic matter to vernal pool basins by wind, flowing water, or other means provides a source of organic carbon to vernal pool habitats. Such carbon sources may be important to supporting a pool's food web (Battle and Golladay, 2001). These organic matter inputs are derived from vegetation that grows within vernal pools and/or in adjacent uplands and wetlands. Transmission corridors are

maintained to support a completely vegetated shrub cover type. Common plants that were observed within Maine transmission corridor uplands during field surveys include *Juniperus communalis* (common juniper), *Spirea latifolia* (meadowsweet), *Rhus typhina* (staghorn sumac), graminoids, several herbaceous species, and hardwood saplings. In wetlands and vernal pools within transmission corridors *Ilex verticillata* (winterberry), *Alnus rugosa* (speckled alder), *Spirea tomentosa* (steeplebush), meadowsweet, *Onoclea sensibilis* (sensitive fern), *Osmunda cinnamomea* (cinnamon fern), and *Scirpus cyperinus* (wool grass) were commonly observed during field surveys. Most vernal pools along the transmission corridor contained significant amounts of organic detritus, which was apparently derived from vegetation within and/or adjacent to the transmission corridor. In addition to providing a source of organic carbon to support secondary production within vernal pools, these plants or their fallen woody branches parts were utilized as amphibian egg mass attachment sites. Subsequent to leaf out, shrub species provide a source of pool shade, as do taller trees adjacent to transmission line corridors.

In order to complete their life cycles and sustain local populations, pool breeding amphibians must be able to successfully migrate across the landscape to suitable non-breeding season habitat (Semlitsch and Skelly, 2008). According to literature, forested settings are the natural and preferred habitat for ambystomatid salamanders and wood frogs (DeGraff and Yamasaki, 2001); however, pool breeding amphibians are known to travel across other non-forested cover types. For example, in one Rhode Island study of golf course fairways, non-forested areas were not a dispersal barrier to spotted salamanders travelling to adjacent forested areas (Montieth and Paton, 2006). The presence of uncompacted leaf litter, coarse woody debris, and shade are important habitat characteristics for pool breeding amphibians (deMaynadier and Hunter, 1995). Areas with high densities of small mammal burrows and cool microclimates have also been found to be preferred by spotted salamanders (Montieth and Paton, 2006).

During field surveys, leaf litter, coarse woody debris, and mammal burrows were all observed within the early-successional cover type of Maine electricity transmission corridors. Shrubs observed in transmission corridors provide shade and organic debris. In addition, many vernal pools within Maine's transmission corridors were found within larger wetland complexes dominated by the scrub-shrub and emergent vegetation cover types. Many of these wetlands spanned the entire transmission corridor, thereby providing a moist environment for amphibians to migrate through as they travel between their breeding pool and adjacent habitat. This demonstrates that transmission corridors are 'permeable' to amphibian migration and movement. This is in contrast to many forms of hard land uses where pavement and construction destroys, removes, or permanently covers burrows, leaf litter, and woody debris, and also introduces the threat of vehicular mortality.

Suitable non-breeding season habitat is also essential for maintaining populations of amphibians that breed in vernal pools. Mean travel distances for spotted salamanders and wood frogs have been calculated at 390 feet and 633 feet, respectively, while maximum travel distances were measured to be 817 feet and 1,549 feet, respectively (numerous studies in Semlitsch and Skelly, 2008).

Transmission corridors surveyed for the MPRP were usually less than a few hundred feet wide; many were less than 150 feet and were adjacent to forested habitat. Therefore, non-breeding season forested habitats adjacent to transmission corridors are well within documented migration distances for pool breeding amphibians. In addition, in Pennsylvania transmission corridors maintained in an early-successional habitat condition were found to provide sufficiently moist microenvironments for salamanders including *Ambystoma jeffersonianum* (Jefferson salamander), *Plethodon cinereus* (red back salamander), and spotted salamander (Yahner et al., 2001). Therefore, it is also plausible that in Maine, the transmission corridor itself may be used as habitat, provided that sufficient leaf litter, burrows, and coarse woody debris, moisture, and shade are present.

5.0 SUMMARY AND RECOMMENDATIONS

In the glaciated northeast, vernal pools have become a focal issue in conservation and land use planning. Regulation of certain vernal pools in Maine has significant implications on the design and permitting of electric transmission corridors and vernal pool management. While existing recommended best development practices for vernal pool conservation are provisional, and were developed to address typically "hard" residential and commercial development, NRPA vernal pool regulations appear to have been developed around these preliminary guidelines and are being applied to a much broader class of land uses (e.g., "soft" land uses including electric transmission line corridors). The most recent literature, however, emphasizes the need for site-specific planning and flexibility for meeting vernal pool conservation needs. Thus, CMP sought to identify vernal pools in its existing transmission corridors and evaluate the implications of the existing regulatory framework on transmission corridor design, permitting, and maintenance. In completing this effort, CMP compiled what is likely one of the largest vernal pool databases in Maine. This new dataset adds to our understanding of vernal pool resources in Maine.

CMP's investigation demonstrates that vernal pools are ubiquitous in transmission corridors located within its service territory. Even after many decades of being managed as early-successional habitat, anthropogenic, natural, and significant vernal pools were found to be common in these corridors. The vast majority (87.5%) of the identified significant vernal pools that would be subject to NRPA jurisdiction currently have vernal pool critical terrestrial habitat that is less than 75 percent forested within 250 feet of the pool; in other words, more than 25 percent of the existing non-forested critical terrestrial habitat around these identified significant vernal pools is managed as early-successional habitat. Field observations of vegetation cover, leaf litter, and coarse woody debris suggest that transmission corridors support habitats that are permeable to the migration of vernal pool breeding amphibians to and from adjacent forests, and that transmission corridors themselves may be utilized as non-breeding season amphibian habitat. The observed abundance of natural and significant vernal pools that were utilized as breeding habitat by obligate vernal pool breeding species suggests that vernal pools in and along transmission corridors are able to function without loss or significant degradation of their ecological function.

These findings are significant relative to vernal pool management as it pertains to electric transmission corridor construction and maintenance. Data on significant vernal pools within and/or along CMP corridors, existing literature, and regulatory guidelines and requirements all demonstrate that significant vernal pools and transmission corridors (as currently constructed and maintained) are compatible. This is further emphasized by the following summary points:

- Extensive data collected by CMP show that significant vernal pools occur in transmission line corridors within the expected frequency range, and at a greater rate than shown in MDIF&W's existing database. Specifically, 45 percent of the

natural vernal pools assessed along CMP transmission corridors were significant. This falls in the middle of the agency-expected range of 40 to 50 percent of all pools assessed being significant;

- The average percentage of non-forested habitat within 250 feet of these significant vernal pools was 44 percent;

- Only 12.5 percent of these significant vernal pools had greater than 75 percent forest habitat coverage with their 250 foot buffers;

- Constructing and maintaining transmission line corridors does not negatively affect vernal pool hydroperiod;

- The early-successional (shrub and herbaceous vegetation) habitat associated with transmission line corridors appears to be permeable to amphibian migration and is capable of sustaining highly productive amphibian breeding habitat;

- The life span of the spotted salamander averages 15 to 20 years. Some of these corridors have been in existence for 40 or more years, a time period which spans multiple generations of spotted salamander. Given that the literature suggests that mole salamanders have high pool spawning fidelity (i.e., over 90 percent of the time they return to spawn in the pools from which they hatched and emerged), the data strongly suggests that several generations of spotted salamanders have successfully reproduced in these vernal pools. In addition, their offspring continue to breed in these pools;

- There is no literature demonstrating adverse impacts from transmission line corridors on vernal pools;

- Current regulations are based on studies that focused on "hard" developments, which are very dissimilar to the vegetated conditions present within transmission line corridors; and

- The current management of vernal pools in transmission line corridors is consistent with some of the significant vernal pool habitat management guidelines and goals presented in Chapter 335 and Calhoun and Klemens (2002). These guidelines and how there are wholly or partially met are as follows:
    - *(1) No disturbance within the vernal pool depression.* CMP and other electric utility companies expend a great amount of effort to ensure that vernal pool depressions are not disturbed during construction and maintenance activities. These efforts include (1) providing environmental oversight during the project design phase to ensure that, whenever possible, pole structures are not placed in vernal pools; (2) implementing and maintaining erosion and sediment controls that help prevent siltation of pools; (3) marking vernal pool depression with flagging tape prior to construction; and (4) performing environmental inspections during

construction to ensure that pools are not traversed by vehicles and construction equipment;

- *(2) Maintain a minimum of 75% of the critical terrestrial habitat as unfragmented forest with at least a partly-closed canopy of overstory trees to provide shade, deep litter and woody debris.* Although transmission line corridors cannot be maintained as forest for reliability and safety reasons (in other words, it is not "practicable"), they are maintained as early-successional habitat composed of shrubs and herbaceous plants. This habitat type provides some level of shading, significant litter accumulation (carbon input) from leaf drop and the die-back of herbaceous vegetation, and woody debris;
- *(3) Maintain or restore forest corridors connecting wetlands and significant vernal pools.* Within transmission line corridors, amphibian travel corridors composed of shrubs and thick growth of herbaceous vegetation are often present. Also, the CMP data indicate that transmission line corridors and their early-successional habitat are permeable to amphibian migration. This meets the needs for maintaining forested travel corridors, which are often required in the vicinity of "hard" development;
- *(4) Minimize forest floor disturbance.* With the exception of pole structure locations, transmission line corridors are not grubbed. Rather, trees are cut at ground level and root systems are left in the ground. In addition, mitigation techniques including winter construction and the use of equipment mats are utilized during construction to minimize ground disturbance such as rutting. By virtue of how transmission line corridors are constructed and maintained, ground disturbance is minimized;
- *(5) Maintain native understory vegetation and downed woody debris.* Transmission line corridors are constructed and maintained to encourage the growth of understory vegetation including shrubs and herbaceous plants. Also, downed woody debris from shrubs occurs naturally and is very common in transmission line corridors.

All of this information indicates that transmission line corridors, as they are currently constructed and maintained in Maine, do not cause a loss of the important ecological functions associated with significant vernal pools in Maine.

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9-8: Vernal Pool Occurrence and Species Distribution within Electrical Transmission Rights-of-Ways in Maine, TRC Environmental, April 2011.

Vernal Pool Occurrence and Species Distribution within Electrical Transmission Right-of-Ways in Maine

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Due to the nature of long distance bulk energy transmission, transmission corridors (or right-of-ways (ROWs)) occur in virtually every landscape position and habitat type across the country. ROWs are managed to sustain non-forested vegetation and can be several hundred feet in width and up to several hundred miles in length. Accordingly, they traverse regulated areas such as wetlands and vernal pool habitats throughout the glaciated northeast. Vernal pools and adjacent habitat areas are regulated by both state and federal agencies, each of which having unique criteria for determining thresholds of jurisdiction. A key aspect to "classically-defined" northeast vernal pool ecology and their regulatory definition is the presence of forested uplands around the pools that provide non-breeding adult-stage habitat for primary vernal pool species such as Ambystomid salamanders and wood frogs (*Rana sylvatica*). Therefore, the management of ROWs to allow only non-forested vegetation in and around vernal pools in the ROW presents a potential conflict for sustaining essential vernal pool habitat conditions. The major question that arises from this potential management conflict is whether and to what extent vernal pools are affected by ROWs in overall occurrence, types of species supported, and the potential populations of organisms based partially on the density of yearly egg masses. Due to the individual permitting requirements associated with several large and geographically diverse ROW maintenance and expansion projects in Maine, an evaluation of a large number of vernal pools occurring in and near ROWs was undertaken to evaluate vernal pool occurrence and species distribution within ROWs. It is worth noting that a large number of the ROWs surveyed have been maintained as non-forested corridors for 40 years or more.

Vernal pool habitats occurring within two large ROW maintenance and expansion projects in Maine were identified and evaluated over multiple breeding seasons. The methodology for field data collection was established based on regulatory criteria, and was similar between the projects. Field parameters included amphibian egg mass counts with species identification as well as other key characteristics cited in scientific literature and regulatory definitions. Surveys were scheduled to observe potential pools during and immediately following the period of active ovipositioning, and in most cases pools were observed twice during the breeding season to view the occurrence of different species that produce egg masses in earlier and later portions of the season. It was also noted if pools were entirely or partially within, or adjacent to the maintained ROW corridor by "percent within the ROW" along this continuum. For purposes of this analysis, pools that occurred within at least 75% within the ROW were considered to be fully "ROW" pools. Categories of pools that were 25 to 75% in the ROW were considered transitional and the balance of the observed pools were considered non-ROW pools. Portions of the projects

involving proposed, undeveloped ROW corridors and potential mitigation sites afforded the opportunity to conduct the same surveys to observe and compare pools within undeveloped areas.

Results for all the surveys were tallied and analyzed for 1,834 vernal pools, all of which contained either wood frog or spotted salamander egg masses, or both. Vernal pool occurrence observations indicate that 55.3% of the total pools observed were considered ROW pools and 23.5% of the pools were found in a non-ROW setting. The remaining 21.2% of the pools were in transitional areas. A total of 1,175 identified pools contained wood frog egg masses. Among these pools, 66.7% occurred in the ROW, 23.7% occurred in transition areas and 9.5% in non-ROW areas. A total of 1,301 identified pools contained spotted salamanders. Among these pools 49.5% occurred in the ROW, 19.9% occurred in transitional areas, and 30.6% occurred in non-ROW areas.

In order to determine the relative "productivity" of each pool in terms of the number of egg masses that were present at the point of seasonally highest occurrence, the number of egg masses occurring per pool for each species was categorized into groups of 1 to 9, 10 to 19, 20 to 39 and 40 or greater egg masses. In this way, it is easier to see which pools could meet the Maine Department of Environmental Protection (MDEP) definition for a Significant Vernal Pool (SVP) (see below). For wood frogs, pools in the ROW (i.e., as above, with 75% of pool occurring in ROW) containing 1 to 9 egg masses comprised 63.7% of the total pools, and 21% of the pools contained 20 or more egg masses (9.3% with 40 or more egg masses). For pools outside of the ROW, pools containing 1 to 9 wood frog egg masses comprised 92.1% of the total pools, and 4.4% of the pools contained 20 or more egg masses (2.6% with 40 or more egg masses). For spotted salamanders, pools in the ROW containing 1 to 9 egg masses comprised 79.5% of the total pools, and 9.1% of the pools contained 20 or more egg masses (3.1% with 40 or more egg masses). For pools outside of the ROW, pools containing 1 to 9 egg masses comprised 62.2% of the total pools, and 26.2% of the pools contained 20 or more egg masses (10.2% with 40 or more egg masses).

This large sampling of data provides the opportunity for several observations. First, while the vernal pool observations concentrated on ROWs and their immediate environs versus a broader study that would compare undeveloped land to ROW, vernal pools containing spotted salamanders and wood frogs egg masses occur half and two-thirds of the time, respectively, directly within ROWs relative to transitional or non-ROW settings. Second, for wood frogs, pools that occur directly within the ROW have a higher egg mass count and distribution per pool (36.3% with 10 or more egg masses) as compared with pools in non-ROW settings (7.9% with 10 or more egg masses). This trend is somewhat reversed for spotted salamanders, though not as pronounced. This suggests that the increased amount of sunlight in an open ROW area compared to an area of dense forested canopy, encouraged wood frog breeding, whereas the spotted salamander prefers deeper depressions with slightly longer hydroperiods typically receiving less direct sunlight.

When looking at pools potentially regulated by the Maine Department of Environmental Protection (MDEP), pools were broken down similarly, as above, with bins (percentage categories) including pools in ranges of ROW occupancy ranging from 0-25%, 26-50%, 51-75%,

and 76-100%. Pools with a 100% rating were found to be completely in a woodland setting, conversely pools with a 0% rating were found to be completely in the non-forested ROW. Due to the majority of the project area being located within existing ROW areas, the data summaries indicate that 67% of the pools surveyed on this project were located nearly entirely within the ROW. Eight percent of the pools within the ROW (0-25% forested) were found to have over 40 wood frog egg masses and therefore potentially regulated by the MDEP. Comparatively, 12% were found to have the same abundance in non-ROW (76-100% forested) settings. For spotted salamanders, a 20 egg mass threshold was used to coincide with MDEP regulations. In the ROW setting, 6% of the pools met MDEP *abundance* criteria, while in the non-ROW setting 20% met the criteria.

These findings are congruent with the results found above as that wood frogs do not show a strong preference between pools with a forested canopy and pools within a maintained ROW setting and therefore demonstrate that maintained ROW vegetation does not seem to be a deterrent in the usage of pools in these areas for breeding. Spotted Salamanders are shown to have a higher abundance within a forested setting as opposed to a maintained ROW and similarly have more pools with the potential to be regulated by the MDEP. This may be explained, as discussed above, by a preference for deeper pools with a more forested canopy.

Continued studies of vernal pools within ROWs and adjacent habitats, including adult population analyses, will help to provide further information about the ecology and viability of vernal pools within non- and semi-forested environments.

9-9: NECEC Potential Compensation Tracts-
Natural Resource Survey Results

Exhibit 9-9

August 13, 2018

CENTRAL MAINE POWER COMPANY

NECEC Potential Compensation Tracts

Natural Resources Survey Results

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152619

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NECEC Compensation Tracts Natural Resources Survey Results

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ACRONYMS AND ABBREVIATIONS

COMPENSATION TRACT	ABBREVIATION	TOWN/TOWNSHIP (Twp)
Little Jimmie Pond-Harwood Tract	LJPT	Manchester
Flagstaff Lake Tract	FLT	Flagstaff & Dead River Twps
Pooler Ponds Tract	PPT	The Forks Plantation Twp
Grand Falls Tract	GFT	Spring Lake Twp
Lower Enchanted Tract	LET	Lower Enchanted Twp
Basin Tract	BT	Pierce Pond Twp

ACRONYM / ABBREVIATION	TERM
ABA	Amphibian Breeding Area
AT	Appalachian Trail
BMPs	Best Management Practices
BCC	Bird of Conservation Concern
BWH	Beginning with Habitat
CFR	Code of Federal Regulations
CMP	Central Maine Power Company
CVP	Corps Vernal Pool
CWA	Clean Water Act
DWA	Deer Wintering Area
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GIS	geographic information system
GPS	Global Positioning System
HVDC	high voltage direct current
I-95	Interstate 95
ILF	In Lieu Fee
IPaC	Information for Planning and Consultation
IWWH	Inland Waterfowl and Wading Bird Habitat
KLT	Kennebec Land Trust
kV	kilovolt
L	Lacustrine
MLUPC	Maine Land Use Planning Commission
MBPL	Maine Bureau of Parks and Land
MCHT	Maine Coast Heritage Trust
MDEP	Maine Department of Environmental Protection
MDIFW	Maine Department of Inland Fisheries and Wildlife
MDMR	Maine Department of Marine Resources
MEGIS	Maine Office of Geographic Information Systems
MGS	Maine Geological Survey

ACRONYM / ABBREVIATION	TERM
MHT	Maine Huts and Trails
MNAP	Maine Natural Areas Program
M.R.S.	Maine Revised Statutes
MW	megawatt
NECEC	New England Clean Energy Connect Project
NED	*New England District*
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NRPA	Natural Resources Protection Act
NWPL	National Wetland Plant List
NWI	National Wetlands Inventory
OM	Organic Matter
PEM	Palustrine Emergent
PFO	Palustrine Forested
POW	Palustrine Open Water
Project	New England Clean Energy Connect Project
PSS	Palustrine Scrub-Shrub
PSVP	Potential Significant Vernal Pool
PUB	Palustrine Unconsolidated Bottom
PVP	Potential Vernal Pool
R	Riverine
RTE	Rare, threatened or endangered
SC	Special Concern
SLODA	Site Location of Development Act/Site Law
SVP	Significant Vernal Pool
T&E	Threatened and Endangered
TNC	The Nature Conservancy
Twp	Township
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VP	Vernal Pool
WMA	Wildlife Management Area
WOSS	Wetlands of Special Significance
WOTUS	Waters of the United States
WQLL	water quality limiting lake

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1.0 NECEC COMPENSATION TRACTS NATURAL RESOURCE SURVEYS

1.1 Introduction

Central Maine Power Company (CMP) proposes to construct the New England Clean Energy Connect Project (NECEC Project or the Project), a high voltage direct current (HVDC) transmission line and related facilities capable of delivering up to 1,200 megawatts (MW) of electric generation from the Canadian border to the New England Control Area in response to the Request for Proposals for Long-Term Contracts for Clean Energy Projects dated March 31, 2017 and issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts.

The proposed NECEC Project is composed of the following components displayed on Figure 1:

- Segments 1, 2, and 3 – HVDC Components and Associated Upgrades
- Segment 4 – 345 kilovolt (kV) STATCOM Substation and 115 kV Rebuilds
- Segment 5 – New 345 kV Transmission Line and Associated Rebuilds

On September 27, 2017 CMP submitted to the Maine Department of Environmental Protection (MDEP) permit applications for the NECEC Project under the provisions of the Site Location of Development Act (SLODA) and the Natural Resources Protection Act (NRPA). On the same date, a related permit application was submitted under the provisions of Section 404 of the Clean Water Act (CWA) to the United States Army Corps of Engineers (USACE). A more detailed description and discussion of the Project can be found in these permit applications.

Section 13, Compensatory Mitigation, of the NRPA application describes in detail the extent of wetland-related impacts that are anticipated to be necessary for construction of the approximately 146.5-mile NECEC Project. These impacts are summarized in Table 1.1 (Table 13-1 of NRPA application) and the majority are temporary or secondary in nature. Several additional forms of impact have also been added below to the original table in response to subsequent discussion and input from regulatory agencies. Permanent, direct impacts to protected natural resources have been minimized to the extent practicable through the Project design process. Direct impacts are associated with permanent fill as opposed to indirect impacts such as vegetation clearing.

TABLE 1-1 SUMMARY OF RESOURCE IMPACTS

RESOURCE IMPACT	ACRES OF IMPACT
Temporary Wetland Fill	47.21 acres
Permanent cover type conversion of Forested Wetlands (Includes wetland cover type conversion within Significant Vernal Pool Habitat (SVPH) and Inland Waterfowl and Wading Bird Habitat (IWWH)	149.07 acres
Permanent upland cover type conversion of IWWH	13.31 acres
Permanent upland cover type conversion of SVPH	31.31 acres
Permanent Fill in Wetlands of Special Significance (WOSS) (Includes fill within SVPH and IWWH)	0.85 acre
Permanent Fill in Wetland (Non-WOSS)	4.47 acres
Permanent upland fill in IWWH	0.01 acre
Permanent upland fill in SVP Habitat	0.74 acre
Direct and indirect impact to USACE Jurisdictional Vernal Pools	4.7 acres in depression or within 100 ft Value: 56 high, 122 medium, 72 low

1.1.1 Wetland Compensation

When in excess of specific permanent impact thresholds, that can be as little as 15,000 square feet (0.34 acre), compensatory mitigation is typically required by the MDEP under the provisions of the NRPA and associated Wetlands and Waterbodies Protection Rules (Chapter 310) to offset loss of functions and values provided by wetlands. The USACE and United States Environmental Protection Agency (USEPA) have established similar rules for "Compensatory Mitigation for Losses of Aquatic Resources" (40 Code of Federal Regulations [CFR] Part 230) as a means of addressing the federal "*No Net Loss*" policy related to Section 404 of the CWA. In addition, *New England District* (NED) *Compensatory Mitigation Guidance* (September 7, 2016) developed by the USACE (hereafter "NED Guidance") is also relevant and provides additional clarification of compensation objectives and requirements in Maine.

Types of wetland compensation recognized by the NRPA (Ch 310 §5(C) (4)) include:

- Restoration of previously degraded wetlands.
- Enhancement of existing wetlands.
- Creation of wetland from upland.
- Preservation of existing wetlands or adjacent uplands where the site to be preserved provides significant wetland functions.

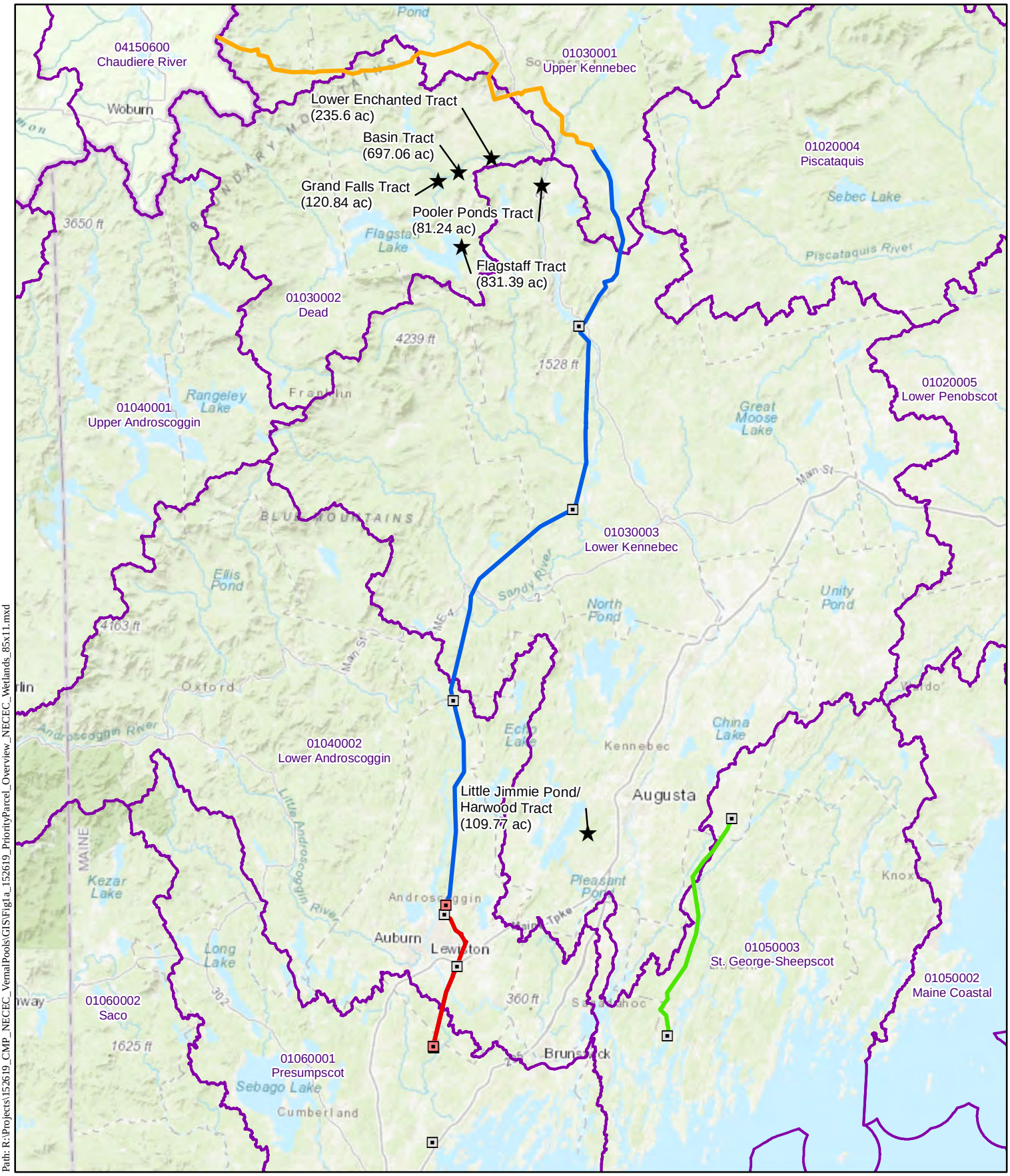
Similar forms of compensation are recognized by NED Guidance, however "Enhancement" is referred to as "Rehabilitation."

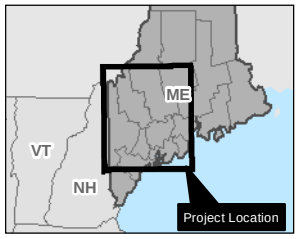
In addition to the above types of "permittee responsible mitigation," another form of compensatory mitigation recognized in Maine by the MDEP, USACE, USEPA, and other federal resource agencies is In Lieu Fee (ILF), where a compensation fee, based on area (square feet) of impact and other variables, is paid into a fund dedicated for implementation of wetland compensation (38 Maine Revised Statutes [M.R.S.] § 480(Z)).

Presented in this document are the results of field surveys augmented by a detailed assemblage of published maps and other information conducted to support the following tracts to be considered for use as Compensatory Mitigation for the NECEC Project:

- Little Jimmie Pond-Harwood Tract (LJPT)
- Flagstaff Lake Tract (FLT)
- Pooler Ponds Tract (PPT)
- Grand Falls Tract (GFT)
- Lower Enchanted Tract (LET)
- Basin Tract (BT)

The locations of the six Compensation Tracts, ranging in size from 81.24 to 831.39 acres, for an aggregate area of 2,075.90 acres, are also displayed on Figure 1.1.





Compensation Tract
Existing Substation
Proposed Substation
HVDC (New ROW)
HVDC (Existing ROW)
Rebuild Section
New 345 kV Line
HUC 8 Watershed Boundary

N
W E
S

1 in = 14 miles

0 7 14
Miles

Figure 1a
Compensation Tract Location
Watershed Boundaries

Kennebec and Somerset Counties
Maine

Date:8/13/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

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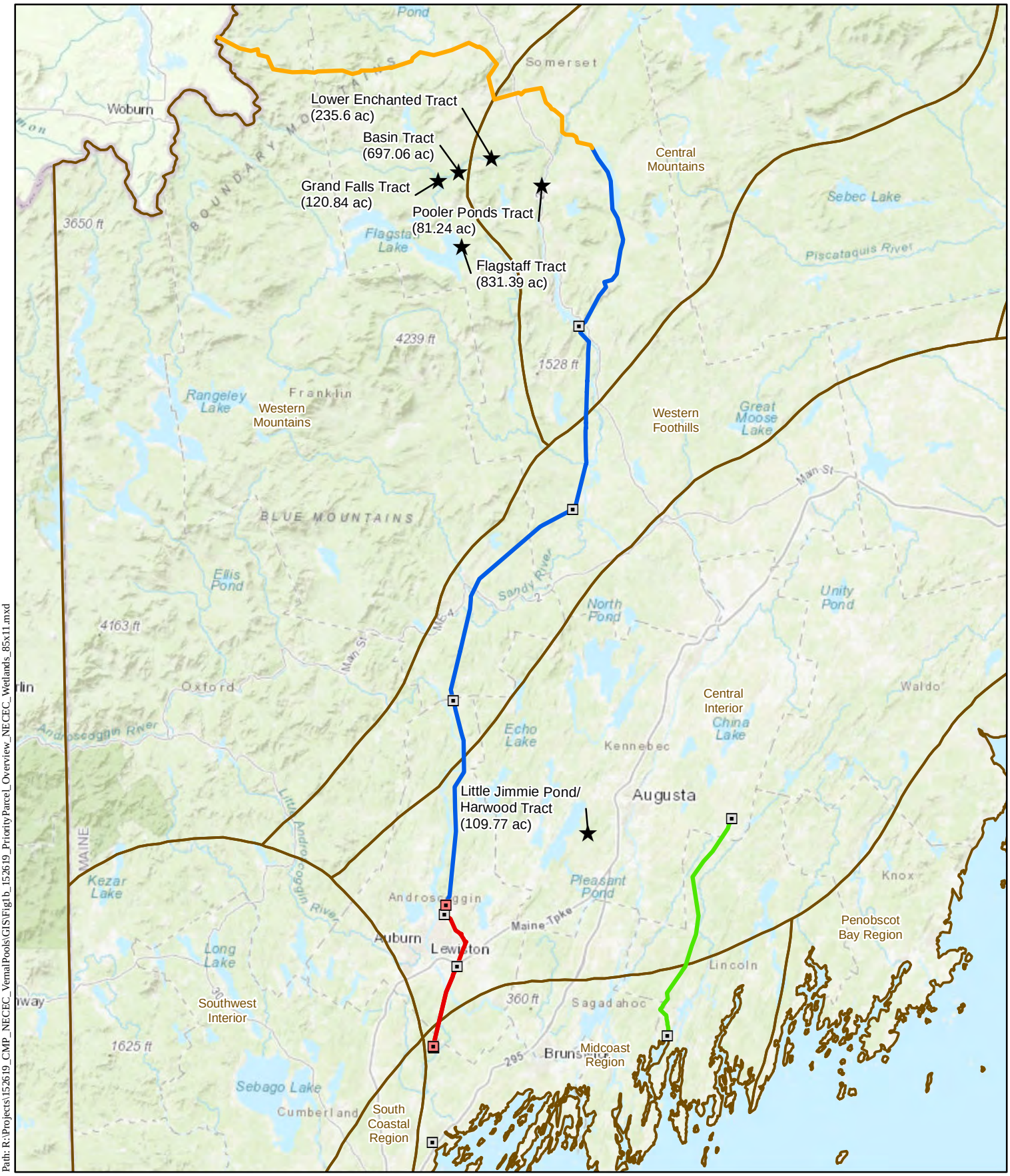

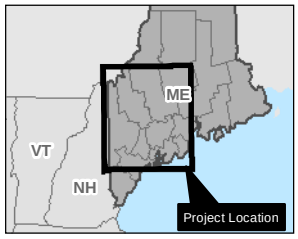

- Compensation Tract
- Existing Substation
- Proposed Substation
- HVDC (New ROW)
- HVDC (Existing ROW)
- Rebuild Section
- New 345 kV Line
- Biophysical Region

N
W E
S

1 in = 14 miles

0 7 14
Miles

Figure 1b
Compensation Tract Location
Biophysical Regions

Kennebec and Somerset Counties
Maine

Date:8/13/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

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1.2 New England District Compensatory Mitigation Guidance

The NED Guidance establishes criteria related to observations, analyses and other considerations relevant to documenting and evaluating potential sites and forms of compensatory mitigation for the six potential NECEC Compensation Tracts. NRPA wetland compensation standards also reflect many of these criteria (Ch 310 §6 A-H). NED Guidance for Mitigation Site Selection generally encompasses:

- Ecologic suitability based on:
    - Hydrologic conditions, soil characteristics and other physical and chemical characteristics.
    - Watershed–scale features such as habitat diversity, connectivity and other landscape scale functions.
    - Size and location relative to hydrologic sources and other ecologic features.
    - Reasonably foreseeable effects on ecologically important aquatic or terrestrial resources.
    - Other relevant factors such as: development trends, anticipated land use changes, habitat status and trends, location in stream network, local or regional goals for protection of particular habitat, and water quality and floodplain management goals.
- Landscape position being of similar setting and wetland types as of the impacted aquatic resource(s).
- Resistance to disturbance by being located near refuges, buffers, green spaces and other preserved natural elements of the landscape.
- Sustainability considerations such as current and future hydrology and preference for locations in areas that will remain as open space not to be severely impacted by clearly predictable development.
- Surrounding land use/plans, including probable future land use.

For preservation as compensatory mitigation in particular, NED Guidance indicates:

- Resources to be preserved provide important physical, chemical or biological function for the watershed.
- Resources to be preserved contribute to the ecological sustainability of the watershed.
- Resources are under threat of destruction or adverse modifications.
- The preservation site will be permanently protected through an appropriate real estate or other legal instrument.

1.3 Analysis of Existing Data

Prior to the commencement of field surveys of the six potential Compensation Tracts, existing information was reviewed to determine the potential extent of wetlands within the survey areas. These source materials included:

- Maine Office of GIS data catalog for Biologic and Ecologic/Environment and Conservation (MEGIS 2018)
- Maine Department of Environmental Protection Interactive Maps and Data (MDEP 2018)

- Maine Department of Inland Fisheries and Wildlife Beginning with Habitat Maps (MDIFW 2018)
- Maine Land Use Planning Commission Land Use Guidance Maps (MLUPC 2018)
- United States Geological Survey 7.5-minute Topographic Quadrangle Maps (USGS 2018)
- United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Wetlands Mapper (USFWS 2018)
- United States Geological Survey (USGS) National Hydrography Dataset (NHD) Viewer (USGS 2018)
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2018 Web Soil Survey (USDA NRCS 2018)
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) of Kennebec and Somerset Counties (FEMA 2018)

The information was compiled and synthesized into a geographic information system (GIS) geo-referenced database and used in the field to assist wetland scientists in the location and identification of wetland systems and other relevant natural resources on the Compensation Tracts.

1.4 Field Survey Methods

NWI Maps developed from photo-interpretation of aerial imagery are a widely used and accepted means to identify the location and general extent of wetlands throughout the United States (Benefiel and Lake 2012). Although information can be misused/misinterpreted, NWI maps are very appropriate for a variety of uses including: preliminary site assessment for development and transportation/utility corridors, environmental impact assessment reports, natural resource inventories, wildlife surveys, refuge planning and acquisition, and land appraisal (Tiner 1997).

The Maine Land Use Planning Commission (MLUPC) supported a study by the USFWS to evaluate the accuracy of NWI maps for use as regulatory wetland guidance maps (Nichols 1994). Amendments dated August 18, 2005 to the MLUPC's Land Use Guidance Maps note adoption of NWI wetlands on the Dead River, Carrying Place, Spring Lake, Lower Enchanted and Pierce Pond Townships and The Forks Plantation, where five of the NECEC Compensation Tracts (FLT, GFT, LET, BT, and PPT) are located. Similar NWI mapping appears on the Augusta 7.5-minute USGS topographic map where the Manchester Tract (LJPT) is located.

Limitations of NWI maps are recognized and attributed to a variety of well identified reasons (Tiner 1997 and 2007; Nichols 1994), some of which are particularly relevant to the NECEC Compensation Tracts. "Omission" rather than "commission" error, or the under-representation versus the over-representation, of wetlands is most common. Particularly relevant limitations responsible for omission error include: imagery scale and quality, difficulty in recognizing "drier-end" wetlands, linear (long) narrow wetlands unmapped due to dimensional scale, difficulty in mapping forested wetlands and difficulty in mapping wetlands on glacial till (Tiner 1997 and 2007); these limitations are present on one or more of the six NECEC Compensation Tracts. Field surveys, documenting the presence, extent and physical characteristics (vegetation, soils and hydrology), as well as preliminary habitat assessments, were therefore undertaken to evaluate and document the suitability of the six Tracts as compensatory mitigation for the NECEC Project.

1.4.1 Wetland Delineation

Evidence indicative of wetland from three parameters – vegetation, soils and hydrology – was used to identify and delineate wetlands in accordance with the 1987, *Corps of Engineers Wetland Delineation Manual* (USACE 1987) and the subsequent *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (USACE 2012). With the exception of unusual or atypical situations, evidence of wetland must be exhibited by all three parameters for an area or position to be designated as wetland.

When used in combination with evidence from the two other parameters, specific vegetation is a conspicuous and rapid means to identify the presence and extent of wetlands. The National Wetland Plant List (NWPL) issued by the USACE provides an indicator rating of a plant being indicative of wetlands or a hydrophyte. The NWPL was used to evaluate vegetation during the delineation of wetland boundaries on the six Compensation Tracts. Lists of vegetation and related NWPL indicator ratings appear as Appendix B for each Tract.

In addition to review of soil mapping by the NRCS web soil survey, throughout the course of field identification and the Global Positioning System (GPS) survey of wetlands on the six Compensation Tracts, soil characteristics including composition (organic vs mineral), texture, color (based on Munsell Soil Color Charts), and presence of redoximorphic features, were also examined in shallow soil profiles with a soil auger. Presence of hydric soils, in combination with dominance of hydrophytic vegetation and evidence of wetland hydrology were therefore used to identify the delineated wetland boundaries.

Hydrologic evidence indicative of wetlands includes a variety of primary and secondary indicators such as surface water, high water table, saturation near the surface and water stained leaves, sediment deposits, drift lines or adventitious roots. In combination with the presence of evidence from vegetation and soils, such examples of wetland hydrology were considered during mapping wetlands on the six potential Compensation Tracts.

1.4.2 National Wetland Inventory Classification

The National Wetland Inventory makes use of *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) to differentiate types of wetlands https://www.fws.gov/wetlands/data/wetland-codes.html. As discussed in subsequent sections, wetlands on each Compensation Tract are identified and described by the NWI code. With this hierarchical classification, most freshwater wetlands on the Compensation Tracts are classified as being of the Palustrine (P) system and then to the class-level, based on dominant plant type as: Forested (PFO), Scrub-Shrub (PSS), Emergent (PEM), or Unconsolidated Bottom (PUB). Wetlands on parts of LJPT and FLT are also of the Lacustrine (L) system, and limnetic (1) subsystem, where instead of plant type, substrate is used to differentiate class-level as being Unconsolidated Bottom (L1UB). In similar fashion, wetlands on parts of GFT, LET and BT are of the Riverine (R) system, and upper perennial (3) subsystem, where substrate is also Unconsolidated Bottom (R3UB). For PPT, being located on the Kennebec River and downstream of the confluence with the Dead River, the subsystem is lower perennial (2) and riverine wetlands on this tract are therefore classified as R2UB.

Due to substrate being the basis for subsystem differentiation for the Lacustrine and Riverine systems, whereas vegetation is used to distinguish Palustrine classes, no attempts were made to capture with GPS the boundaries/areal extent of Lacustrine or Riverine wetlands. Practicality also entered into this decision from the simple basis of seasonal variability of water levels as well as, how far into the lake or river does a GPS polygon extend to arrive at corresponding acreage? Consequently, length or “frontage/river-miles,”

(measured in feet/miles), is deemed to be a more appropriate unit for uniformly quantifying Lacustrine or Riverine wetlands on the Compensation Tracts. Where a segment of Riverine wetland lies wholly within a Tract, (as is the case for a reach of the Dead River on GFT or Enchanted Stream on LET), an approximation of acreage derived from length and representative width is presented for the Riverine wetland units, chiefly for comparative purposes in relation to the size of the overall Tract as well as other delineated and GPS-surveyed palustrine wetland classes.

It is important to recognize that except where bordered by bedrock cliffs such as on LET and GFT, along essentially all Riverine system wetlands, a bordering band of PSS is present and most typically dominated by alder (*Alnus* spp.) or willows (*Salix* spp.). The width of this PSS is dependent on substrate, scour from higher stream stage and steepness of abutting slope. Although present due to mapping scale the band of PSS was not delineated or GPSed where less than approximately 30 feet in width along the river edge. Consequently, GPSed wetland acreage on PPT, LET, GFT and BT is inherently conservative and would therefore equate to an additional approximately 3.5 acres (30 feet by 5,280 feet /43,560 square feet) of PSS per river-mile along the Kennebec and Dead Rivers.

Streams of lesser size than the Kennebec and Dead Rivers or Enchanted Stream are typically not addressed by NWI mapping. The USGS National Hydrography Dataset (NHD), which is akin to NWI mapping but for rivers and streams, provides GIS-based data from which river and stream lengths on the Compensation Tracts are quantified. Unmapped smaller streams encountered in palustrine wetlands during the spring 2018 field surveys are displayed on accompanying tract resource maps (Figures 2.2, 3.3, 4.3, 5.3, 6.3 and 7.3). The mapping is supported by documentation of observed fundamental characteristics (perennial, intermittent or ephemeral flow, width/depth, substrate, fish, beaver dams, etc.). Field surveys also provide a means to reliably compare from tract to tract, the acreage of reaches of rivers or streams contained entirely within Tracts such as the Dead River and Enchanted Stream on GFT and LET respectively.

1.4.3 Wetlands of Special Significance

Under the provisions of the NRPA and related Rules (Chapter 310), certain characteristics are relevant to whether a wetland is regulated as a "freshwater wetland of special significance" (Ch 310 §4A 1-8). Characteristic of Wetlands of Special Significance (WOSS) that could potentially occur on the Compensation Tracts are listed below along with coding used in subsequent sections describing the presence of WOSS on each Tract:

- contains a "*critically imperiled* (S1)" (Ch 310 §3F) or "*imperiled* (S2)" (Ch 310 §3L) community as defined by the Natural Areas Program [**S1/S2**];
- is identified as "*significant wildlife habitat*" (38 MRS §480-B(10)) by the Maine Department of Inland Fisheries and Wildlife (MDIFW) [**SWH**] including:

    1. habitat for state or federal listed endangered or rare species,
    2. high and moderate value "*deer wintering areas*" (DWA) and travel corridors,
    3. high and moderate value *inland waterfowl and wading bird habitat*" (IWWH), and
    4. "*significant vernal pools*" (SVP);
- is located within 250 feet of a "*great pond*" (38 M.R.S. §480-B(5)) **[GP 250]**;

- contains more than 20,000 square feet of open water or aquatic or emergent marsh vegetation [**20k POW/PEM**];
- is a "*floodplain wetland*" (38 MRS §480-B(2-D)) inundated with floodwater during a 100-year flood event based on mapping by FEMA (Ch 310 §4A (6)) **[FP]**;
- is a "*peatland*" (Ch 310 §3P) [**PT**]; or
- is located within 25 feet of a "*river, stream or brook*" (38 M.R.S. §480-B(9), Ch 310 §4A (8)) [**RSB**].

1.4.4 Vernal Pools

Vernal pools are defined by the MDEP as: "a natural, temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish" (Chapter 335 §9). "Significant vernal pools" are recognized by the presence of fairy shrimp (Eubrandhipus spp.), or specific numbers of blue spotted salamander (Ambystoma laterale), spotted salamander (Ambystoma maculatum) or wood frog (Lithobates sylvaticus) egg masses; in central Maine, MDIFW guidelines recommend evidence of these species be observed between April 25th and May 25th. Vernal pools documented to be used by state-listed rare, endangered or threatened species such as Blanding's turtles (Emydoidea blanddingii), spotted turtles (Clemmys guttata), boghaunter dragonflies (Williamsoni fletcheri, W. interni), Eastern ribbon snakes (Thamnophis sauritus), wood turtles (Clemmys insculpta), four-toed salamanders (Hemidactylium scutalum), swamp darner dragonflies (Epiaeschna heros), and comet darner dragonflies (Anax longipes), are also considered to be "significant vernal pool habitat" (Ch 335 §9B 1-4).

Under the provisions of Section 404 of the federal Clean Water Act, the USACE regulates activities in "waters of the United States," which include vernal pools. Vernal pools are defined by the New England District of the USACE in the General Permit (GP) for the state of Maine reissued on October 13, 2015. The USACE definition, while very similar to the MDEP's does not reference "natural" and does not recognize or differentiate significant vernal pools based on number of certain egg masses. Instead, the GP definition indicates: "…the presence of any of the following species in any life stage in any abundance level/quantity would designate the waterbody as a vernal pool: fairy shrimp, blue spotted salamanders, spotted salamanders or wood frogs. The Corps may determine during a Category 2 Review that a waterbody should not be regulated as a vernal pool based on available evidence."

Activities in and adjacent to certain types of vernal pools are regulated by the MDEP under the provisions of the NRPA. The extent of this jurisdiction can be as far as 250 feet outward of what are referred to as "significant vernal pools" Chapter 335 §9A(7)) to encompass "critical terrestrial habitat." Under the Maine GP, the USACE also regulates activities in vernal pools and outward from the perimeter for a distance of as much as 750 feet to encompass what is referred to as the "VP management area." Therefore, the spring 2018 screening provides information relevant to amphibian habitat surrounding vernal pools as well as a preliminary indication of the potential extent of regulatory jurisdiction.

Due to these differences in definitions which result in dissimilar approaches to regulatory jurisdiction, the following classification was established for the spring 2018 survey for vernal pools and vernal pool-like features occurring at each of the six Compensation Tracts. Although several rounds of surveys took place during May through June at LJPT, the classification was also developed to account for the brief, solitary reconnaissance-level surveys conducted during early June for the substantially larger tracts in the northern region along the Kennebec and Dead Rivers.

- **SVP** – "S***ignificant Vernal Pool***": Meets MDEP definition (Ch 335 (9)) with appropriate number of indicator egg masses.
- **PSVP** – **Potentially Significant Vernal Pool**: Meets MDEP definition except with >50% required number (i.e., not 100%) of indicator egg masses.
- **VP** – **Vernal Pool**: Meets MDEP definition except <50% required number (i.e., not 100%) or no indicator species egg masses.
- **CVP** – **Corps Vernal Pool**: Occurs in "*waters of the United States*" (WOTUS), typically in areas of disturbance (i.e., not "natural" per MDEP definition) such as skidder/ATV ruts, and contains indicator species egg masses. The other above forms of vernal pools are also subject to USACE jurisdiction.
- **PVP** – **Potential Vernal Pool**: exhibits depression/basin characteristics of VP or CVP but due to brief solitary survey, no other finding made (typically PVPs are reviewed again during a second survey).
- **ABA** – **Amphibian Breeding Area**: Not a MDEP vernal pool, not in USACE WOTUS (therefore, not regulated) but feature (i.e., mud puddle, rut in upland) contains any number of indicator egg masses.

Based on the observation of qualified wetland scientists, these resources have been tentatively identified as high, medium, or low value in accordance with the USACE Mitigation Guidance, but they are not proposed to offset vernal pool impact within the Project areas because they have not been verified. For this reason, CMP's compensation plan provides compensation in the form of ILF.

The boundaries of the wetlands and location of streams/waterbodies, vernal pools, and other natural resources on the Compensation Tracts were delineated in the field with colored flagging. Flagging positions and data point locations were recorded using a Trimble Geo XT mapping-grade GPS unit with positional data post-processed to sub-meter accuracy for transfer onto GIS-based mapping of natural resources on the individual Compensation Tracts.

1.4.5 Rare, Threatened, and Endangered Species

Numerous plant and animal species in Maine are considered rare, threatened, or endangered (RTE) and are protected under the federal Endangered Species Act of 1973 (16 United States Code [U.S.C.] §§ 1531 et seq.), the Maine Endangered Species Act, and/or the Maine Natural Areas Program (MNAP) statute (12 M.R.S. §§ 544, 544-B & 544-C). Under the federal Endangered Species Act, 'endangered' means a species is in danger of extinction throughout all or a significant portion of its range; 'threatened' means a species is likely to become endangered within the foreseeable future. Under the Maine Endangered Species Act, species of 'special concern' are administrative categories established by policy, not regulation, and are for planning and informational purposes (MDIFW 2009). Updated records of federally- and state-listed RTE species are maintained by the USFWS and MNAP, respectively. The online tool created by the USFWS, Information for Planning and Consulting (IPaC), generates a register of any listed species, critical habitat, migratory birds, or other natural resources that occur within the roject boundaries provided by the user. MNAP assesses rareness of plants and animals through analysis of historical research, field surveys, and evaluation by professionals; these assessments are updated biennially.

Regarding the compensation parcels evaluated within the scope of this Project, five of six tracts (FLT, PPT, GFT, LET, and BT) occur in Somerset County, and the remaining tract (LJPT) is in Kennebec

County. Lists of the RTE plant species currently and/or historically known to occur in Somerset and Kennebec Counties were compiled using publicly available information from the MNAP Rare Plant List and Rare Plant Fact Sheet. Of the 347 RTE plant species currently tracked in Maine, a total of approximately 87 species are found or have been found in Somerset County, and a total of approximately 36 are found or have been found in Kennebec County. Given that RTE plant species often have high coefficients of conservatism (a 0 through 10 metric of the Floristic Quality Index of plants native to a region) and are thus associated with specific ecological niches, each of these species was filtered by habitat preference to estimate potential of occurrence. Plants found in habitats not present on any of the tracts (such as, but not limited to, alpine, estuarine, and coastal environments) were disregarded. While surveys for rare species were not formally conducted, species with phylogenetic affinity to those on the RTE list were given appropriate scrutiny. Preliminary observations of plants were noted and appear in Appendix B for each tract. Due to the scope and the schedule of the Project, as well as to variations in phenology and time limitations, identification of all plants on the tracts was not possible.

An informal list of endangered animals was compiled for each tract (Appendix A) using the IPaC program from the USFWS website. Although not considered an official list for the purposes of permitting, the list provided a guideline for surveyors to look for evidence of these species. Observations of animal signs were documented, and details are included in the wildlife section of each tract. Migratory birds and songbirds were identified based on sight or auditory call.

1.5 Functional Assessments

A *Descriptive Approach* to assessing wetland functions and values, described in a September 1999 supplement (the Supplement) to *The Highway Methodology Workbook* by the New England Division of the USACE (USACE-NED 1999), is an assessment method recognized and accepted by the MDEP. Functions and values of wetlands on Compensation Tracts have been evaluated by this method and are summarized below. As described in Section 12 of the September 27, 2017 NRPA permit application, the same assessment method was used to evaluate all wetland areas under state or federal jurisdiction that may be impacted by the NECEC Project. Specific functions and values determined to be provided by wetlands at individual Compensation Tracts are discussed in subsequent sections.

The Supplement indicates "*Wetland functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society.*" Wetland functions relate to the ecological significance of wetland properties without regard to subjective values. Wetland functions are generally considered to be the result of biologic, geologic, hydrologic, biogeochemical, and/or physical processes that occur or take place in a wetland. Functions and values of wetlands are dependent on, and influenced by, various physical characteristics at the site, which are indicative of relative levels of function and value. These include: size and proximity of wetlands to ongoing development activity, geologic setting, soil characteristics, presence and duration of hydrology, landscape position, and wetland cover type. Consequently, the effects of changes to these physical characteristics are evaluated in assessing whether an activity or project impacts wetland-specific functions and values.

Functions attributed to wetlands include the following:

- Groundwater Recharge/Discharge (**GW**) – considers the potential for a wetland to serve as a groundwater recharge or discharge area.
- Floodflow Alteration (Storage & Desynchronization) (**FS**) – considers the effectiveness of a wetland in reducing flood damage by water retention for prolonged period following precipitation event and the gradual release of floodwaters. It adds to the stability of the wetland ecological

system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

- Fish and Shellfish Habitat (**FH**) – considers the effectiveness of seasonal or permanent watercourses associated with the subject wetland for fish and shellfish habitat.
- Sediment/Toxicant/Pathogen Retention (**STPR**) – considers the effectiveness of a wetland as a trap for sediments, toxicants or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas such as preventing ill effects of nutrients entering aquifers or downstream surface waters.
- Nutrient Removal/Retention/Transformation (**NR**) – considers the effectiveness of a wetland as a trap for nutrients in runoff water from surrounding uplands or upstream eroding wetland areas the ability of the wetland to process these nutrients in other forms or trophic levels and thereby functioning to reduce or prevent degradation of water quality.
- Production (Nutrient) Export (**PE**) – evaluates the effectiveness of a wetland to produce food or usable products for humans or another living organism.
- Sediment/Shoreline Stabilization (**SS**) – considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.
- Wildlife Habitat (**WH**) – considers the effectiveness of a wetland to provide habitat for various types and populations of animals (resident and migratory) typically associated with wetlands and the wetland edge.

Wetland values are generally considered to be benefits derived from either these functions or other characteristics of a wetland. Perceived values arise from the functional ecological processes exhibited by wetlands but are determined also by human perceptions, the location of a particular wetland, the human pressures on a wetland, and the extent of the resource (Mitsch and Gosselink 1993). The value of a particular function, or combination thereof, is based on human judgment of the worth, merit, quality, or importance attributed to those functions. Values attributed to wetlands include the following:

- Recreation (**REC**) – considers the suitability of a wetland and associated water courses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.
- Education/Scientific Value (**ED**) – considers the suitability of the wetland as a site for an "outdoor classroom," or as a location for scientific study or research.
- Uniqueness/Heritage (**UQ**) – considers the effectiveness of a wetland or its associated waterbodies to provide certain special values, that may include archaeological sites, critical habitat for endangered species, and its overall health and appearance, role in the ecological system of the area, and relative importance as a typical wetland class for this geographic location whereby these functions are clearly valuable attributes relative to aspects of public health, recreation and habitat diversity.
- Visual Quality/Aesthetics; and (**VQ**) – considers the visual and aesthetic quality and usefulness of a wetland.
- Threatened or Endangered Species Habitat (**ES**) – considers the suitability of a wetland to support threatened or endangered species.

The functions and values identified above may vary slightly in terminology, but encompass all the functions identified in, and addressed by, the NRPA Wetland Protection Rules. As defined in these Rules, "functions" are:

The roles wetlands serve which are of value to society or the environment, including but not limited to, flood storage, flood water conveyance, ground water recharge and discharge, erosion control, wave attenuation, water quality protection, scenic and aesthetic use, food chain support, fisheries, wetland plant habitat, aquatic habitat and wildlife habitat (Chapter 310 §3J).

A basic concept presented by the Supplement is an identification of "Considerations/Qualifiers" that can be used as indicators or descriptors of the presence of particular functions or values. From as few as three to as many as 32 of these "Considerations/Qualifiers" are identified in Appendix A of the Supplement for each of the respective wetland functions and values. These "Considerations/Qualifiers" therefore become a checklist or outline of indicators of functions and values for wetland scientists to observe, compare against, and structure assessments. The Supplement indicates these "Considerations" are intended to be flexible and are ultimately based on "best professional judgment." Consequently, as described in Section 12 of the September 27, 2017 NRPA permit application, the effects of changes to these physical characteristics have also been evaluated for these same wetland-specific functions and values by the NECEC Project.

2.0 LITTLE JIMMIE POND–HARWOOD TRACT

2.1 Site Location Information

Municipality: Manchester **County:** Kennebec

Biophysical Region: Central Interior

Watershed (HUC 12): Upper Cobbosseecontee Stream (010300032308)

NECEC Components within HUC 8 (01030003) Watershed: HVDC, Existing Right-of-Way

Closest NECEC Component: Corridor Expansion Site (Livermore Falls)

Coordinates of Site Centroid (Lat/Long WGS 84): 44°16'18.21"N, 69°52'23.75"W

2.2 Natural Resource Inventory Summary **(quantities are +/-):**

Total Site Area .....109.77 acres

NWI Palustrine Wetland Area.....75.01 acres

Delineated and GPS-surveyed Palustrine Wetland Area..... .....68.08 acres

NHD Rivers and Streams..... 2,410 feet (0.46 mile)

Delineated and GPS-surveyed Rivers and Streams.....3,030 feet (0.58 mile)

Upland Area.....41.69 acres

Inland Waterfowl and Wading Bird Habitat (Moderate Value)……....71.92 acres

Significant Vernal Pools.....none

Other Vernal Pool Types……...2 high value PSVPs, 6 medium value VPs, 1 low value VP

Vernal Pool Critical Terrestrial Habitat (750 feet)..... 81.84 acres

Deer Wintering Area……..…….0.5 acre

2.3 Site Description

The approximately 109.77-acre Little Jimmie Pond-Harwood Tract (hereafter “LJPT” or “the Tract”) is in Manchester, Maine approximately 4.7 miles from the state capitol in Augusta. LJPT is comprised of distinct western and eastern parcels. The Tract has about 710 feet of frontage on the south side of Collins Road that borders the north end of Hutchinson Pond and extends to the west toward Benson Road (Figure 2.1).

The northern side of the western parcel shares an approximately 1,200-foot boundary with the MDIFW 886-acre Jamie’s Pond Wildlife Management Area (WMA) which in addition to hunting and fishing opportunities, provides a network of trails that are quickly accessed by the daily commuters and citizens in surrounding communities (Capital Walks 2008).

With approximately 900 feet of frontage on Hutchinson Pond, the east parcel is located approximately 800 feet north of the 81-acre Hutchinson Pond property that was protected and preserved as compensatory

mitigation for Central Maine Power Company's Maine Power Reliability Program (MPRP) Project and is now managed by the Kennebec Land Trust (KLT 2018). Wetlands on the eastern parcel extend southward along the intervening distance between the LJPT and the KLT properties.

2.4 Surrounding Land Use, Protected Open Space and Focus Areas

Surrounding lands in the general vicinity of the LJPT are primarily forested, with residential homes, small fields, and secondary roads scattered throughout the area. The Tract frontage on Collins Road would provide an access point to the property for future development. The property is approximately 12.7 miles from Exit 109 on Interstate 95 (I-95) in Augusta, and therefore is at risk for future development given its relatively close proximity to the greater capital area. The developable land is field-verified, forested upland in and around wetland areas of various cover types. Approximately 20 acres (18%) of the Tract harbors the potential for Rural/Residential (R1) housing development (Figure 2.2). The minimum lot size for the R1 zone in Manchester is about two acres (Town of Manchester 2017), allowing for an estimated 10 homes to be built.

LJPT is hydrologically connected via the outlet of Hutchinson Pond to Cobbosseecontee Stream and ultimately the Kennebec River. Immediately to the east of the tract on the opposite side of Benson Road is Beginning with Habitat's Cobbossee–Annabessacook Focus Area (BWH 2018a). The focus area is comprised of extensive areas of wetlands that provide habitat for wintering deer, rare species, and outstanding habitat for wading birds and waterfowl. Rare plants and animals noted in the focus area include water stargrass (*Heteranthera dubia*), least bittern (*Ixobrychus exilis*), and ribbon snake (*Thamnophis sauritus*).

The location of the LJPT in proximity to ecological focus areas, conservation lands, and protected wildlife areas provide enhanced value to the property from a protected land standpoint, primarily due to connectivity with these other parcels that will provide greater habitat functionality at a landscape scale. The current lack of development in the surrounding landscape and proximity to protected lands provides large buffer areas which augment the overall ecological functions of the property, specifically the diverse set of wetland systems located on site.

2.5 Wildlife Use

Evaluations of the landscape (i.e., aerial photo interpretation) and on-site investigations were performed to document both wildlife use and available habitat on the Tract. The presence of variable habitat types across the Tract makes it an attractive landscape for a wide variety of fauna. Habitat types found on LJPT include forested uplands comprised of mixed vegetation, emergent wetland marsh (Photos 2.1 and 2.2), scrub-shrub wetlands (Photo 2.3), forested wetlands (Photo 2.4), black spruce bog (Photo 2.5), streams, and seasonally flooded wetlands.

The variable habitat on LJPT, such as mixed forests, scrub-shrub, emergent marsh, forested wetlands, and uplands, provides opportunity for a wide variety of bird species that are typically found in the greater central Maine region. Game birds such as ruffed grouse (*Bonasa umbellus*) and wild turkeys (*Meleagris gallopavo*) were both heard and observed on the Tract. Variation in cover types provides habitat for a variety of raptors, owls, woodpeckers and passerine species. During site survey efforts, a bald eagle (*Haliaeetus leucocephalus*) was observed in flight over Hutchinson Pond near the southeastern end of the east parcel. Mapped IWWH is available in the large marsh on the north end of Hutchinson Pond (Figure 2.2). Two American bitterns (*Botaurus lentiginosus*) were observed and heard calling from the marsh during field surveys. In the open water sections of the marsh, common loon (*Gavia immer*), mallard (*Anas platyrhynchos*) and black ducks (*Anas rubripes*) were noted. Beaver (*Castor canadensis*) activity was

observed in the marsh with recent tree cuttings, dam building activity and an active lodge (Photo 2.2). An adult barred owl (*Strix varia*) with two fledglings was also observed in the forested upland along the western edge of the marsh. Other birds observed or heard calling during field surveys included oven bird (*Seiurus aurocapilla*), winter wren (*Troglodytes hiemalis*), black capped chickadee (*Poecile atricapillus*), white-breasted nuthatch (*Sitta carolinensis*), pileated woodpecker (*Hylatomus pileatus*), hairy woodpecker (*Leuconotopicus villosus*), downy woodpecker (*Picoides pubescens*), red wing blackbird (*Agelaius phoeniceus*), great blue heron (*Ardea herodias*), and multiple warbler species.

There are numerous vernal pools of varying sizes, depths, and types located on LJPT. Some of these pools fit the classic definition of a vernal pool (i.e., isolated depressions surrounded by upland forest) while others are topographic depressions within larger wetland complexes. For instance, numerous depressional vernal pools (Photos 2.7 and 2.8) are located within topographic lows of the black spruce bog on the west parcel. During springtime vernal pool investigations, wood frogs (*Lithobates sylvaticus*) and spotted salamander (*Ambystoma maculatum*) were noted as actively breeding in pools on site, as per the presence of their respective egg masses. Two were rated as high value PVPs, six as medium value VPs and one as a low value VP. Other herptiles observed at LJPT include garter snakes (*Thamnophis* spp.), green frog (*Lithobates clamitans*), bull frog (*Lithobates catesbeianus*), American toad (*Anaxyrus americanus*) and northern leopard frog (*Lithobates pipiens)* were also noted.

There are approximately 3,030 linear feet of stream and two beaver impoundments on the Tract. Two of the streams (totaling 620 feet in length) are relatively small, approximately two to three feet wide, with intermittent flow. Each stream drains through forested wetlands into the large emergent marsh in the east parcel. The remaining length is a larger perennial stream that flows beneath Collins Road onto the Tract's east parcel and then through the emergent marsh into Hutchinson Pond at the southeastern corner of LJPT. This approximately 20 feet wide, straightened stream is ponded in areas by beaver impoundments (Figure 2.3).

Due to the diverse range of habitats on the LJPT along with its direct connection and close proximity to other conserved lands in the area, a wide range of mammal species typically found in the central Maine region can utilize the Tract. On site surveys noted the presence of snowshoe hare (*Lepus americanus*), beaver, porcupine (*Erethizon dorsatum*), raccoon (*Procyon lotor*), white-tail deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), and red squirrel (*Sciurus vulgaris*). A preliminary review of the property using the USFWS online IPaC system was conducted to evaluate potential presence of federally threatened or endangered species. The results of the IPaC review appear in Appendix 2A.

2.6 Vegetation

LJPT consists of a variety of vegetative communities (Appendix 2B) which provide different cover types and habitat characteristics. The property is primarily composed of mature wetland and upland forests, portions of which include predominantly coniferous and mixed coniferous-deciduous forest. There are large areas of emergent marsh located in the east parcel. Of note is a black spruce (*Picea mariana*) bog on the eastern area of the west parcel.

Dominant tree species in the mixed evergreen-deciduous upland forests of the west parcel are eastern hemlock (*Tsuga canadensis)* and American beech (*Fagus grandifolia*). The shrub stratum contains saplings of the above-mentioned tree species, as well as American witch hazel (*Hamamelis virginiana*) and striped maple (*Acer pensylvanicum*). Common herbaceous plants in the understory consist of violet (*Viola* spp.), wood sorrel (*Oxalis montana*), starflower (*Lysimachia borealis*), Canada mayflower

(*Maianthemum canadense*), evergreen wood fern (*Dryopteris intermedia*), and prickly tree club-moss (*Dendrolycopodium dendroideum*).

Dominant tree species in the mixed evergreen-deciduous upland forest enveloped by the emergent marsh (PEM) of the east parcel include red maple (*Acer rubrum*), eastern white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), ironwood (*Carpinus carolinianus*), gray birch (*Betula populifolia*), and white ash (*Fraxinus americana*). The shrub stratum in this area consists of saplings of the aforementioned tree species. The understory consists primarily of New York fern (*Parathelypteris novaboracensis*), brackenfern (*Pteridium aquilinum)*, sarsaparilla (*Aralia nudicaulis*), Canada mayflower, and starflower.

The emergent marsh (PEM) on the eastern section of the east parcel is predominantly composed of tussock sedge (*Carex stricta*) and bluejoint grass (*Calamagrostis canadensis*). The shrub stratum occurs in the ecotone between open wetland and upland forest and consists primarily of meadowsweet (*Spiraea alba* var. *latifolia*), smooth arrow-wood (*Viburnum dentatum*), and speckled alder (*Alnus incana* ssp. *rugosa*).

In the black spruce bog (PFO4/1), the dominant tree species are black spruce and red maple. The shrub layer consists of Labrador tea (*Rhododendron groendlandicum*) and common winterberry (*Ilex verticillata*), along with a mix of eastern hemlock, black spruce, and eastern white pine saplings. The herbaceous layer is comprised predominantly of barber-pole bulrush (*Scirpus microcarpus*), cinnamon fern (*Osmundastrum cinnamomeum*), common woolsedge (*Scirpus cyperinus*), three-seeded sedge (*Carex trisperma*), rough bedstraw (*Galium asprellum*), marsh fern (*Thelypteris palustris*), and poison ivy (*Toxicodendron radicans* ssp. *radicans*). Common nonvascular plants present include various species of *Sphagnum* mosses.

Forested wetlands (PFO1) are dominated by eastern hemlock, red maple, balsam fir, and yellow birch (*Betula alleghaniensis*). The typical shrub understory includes yellow birch saplings. Dominant herbs, grasses, and graminoids are sensitive fern (*Onoclea sensibilis*), cinnamon fern, interrupted fern (*Osmunda claytonia*), violet, bladder sedge (*Carex intumescens*), and silvery sedge (*Carex canescens*).

Along the northwestern corner of the western parcel, there is a beaver impounded open water area with a mix of live and standing dead snags of red maple. The herbaceous layer consists primarily of three-seeded sedge, common wool sedge, common soft rush (*Juncus effusus*), broadleaf cattail (*Typha latifolia*), and bur-reed (*Sparganium* spp.). Floating aquatic plants present are common duckweed (*Lemna minor*).

There were no observations of invasive plant species within the wetlands located on the LJPT. The lack of invasive species within the wetlands on site generally increases the overall functions of each wetland system.

2.7 Wetland Characteristics, Functions and Values

Approximately 68.08 acres (62%) of the 109.77-acre LJPT were identified as wetland during the field survey effort. The primary wetland system on the eastern parcel (Photos 2.1, 2.2, and 2.3) is a large emergent marsh (PEM) located on the northern end of Hutchinson Pond at the southeast corner of the parcel. The portion of the marsh located on the LJPT totals approximately 50.5 acres. A perennial stream flows from the northern property boundary through the large marsh and into Hutchinson Pond (L1UB). The stream flow is relatively low velocity that has further slowed to a ponded condition by an active beaver dam. This creates outstanding wildlife habitat for inland wading birds and waterfowl (IWWH) rated as moderate value by MDIFW. The marsh is surrounded by a perimeter of scrub-shrub wetland (PSS) that transitions into forested wetland in most locations before ultimately becoming upland forest

both along the western marsh edge and within the large section of upland in the center of the marsh. The transitional habitat between open water, emergent marsh, scrub-shrub, forested wetland, and upland forest provides a high degree of vertical stratigraphy in vegetation that further enhances wildlife function for numerous species of amphibians, reptiles, birds, and mammals.

A deer wintering area is located between the west and east parcels and the based on the exent of confierous cover the approximately one-half acre mapped to occur on the west parcel (Figure 2.3) is likely to be larger. Numerous established hunting tree stands were noted along the edge of the emergent marsh in the east parcel. Hunting stands were also observed in the upland areas around the marsh to the west. Established game trails along with tracks, droppings, and tree rubs from white tail deer suggest that the east parcel is a productive location for hunting activities. Other hunting activities would include turkey, grouse, and waterfowl due to the proximity to Hutchinson Pond and the open water sections of the emergent marsh.

In addition to hunting, the frontage along the northern end of Hutchinson Pond in the east parcel would provide opportunity for other recreational activities such as canoeing or fishing. According to MDIFW, Hutchinson Pond is a warm water fishery with principal species of largemouth bass (*Micropterus salmoides*) and chain pickerel (*Esox niger*). In addition to warm water species, MDIFW annually stocks brook trout (*Salvelinus fontinalis*) in Jimmie Pond to the north of LJPT. During spring and fall seasons when water temperatures are adequate, it is likely that brook trout migrate south through the perennial stream connecting Jimmie Pond to Hutchinson Pond, offering an opportunity for trout fishing both in the stream and Hutchinson Pond.

The primary wetland system on the west parcel is an approximately eight-acre black spruce bog (Photo 2.5). The bog is comprised of a mix of deciduous and coniferous trees, primarily black spruce and red maple, with dense shrub and herbaceous layers. The dense understory provides habitat for various birds, amphibians, and mammals.

The soils in the lowland portions of the site are comprised primarily of organic materials underlain with glaciomarine sediment. Organic soils (Togus fibrous peat) are located in both the emergent marsh and the black spruce bog. Mineral soils (Paxton-Charlton very stony fine sandy loams and Ridgebury very stony fine sandy loam) are found in the remaining wetlands on site and are primarily derived from very stony glacial till that has a dense restrictive layer which impedes stormwater penetration and perches runoff. Portions of the site at higher elevations are derived from moderately deep glacial tills (Woodbridge very stony fine sandy loam) which are moderately well drained.

There were no observations of invasive plant species within the wetlands located on the LJPT. The lack of invasive species within the wetlands on site generally increases the overall functions of each wetland system.

The principal functions and values of the wetlands located on LJPT are wildlife habitat, nutrient removal, sediment/toxicant retention, recreation, flood flow alteration, groundwater recharge/discharge, and production export. The primary wetland systems in the east and west parcels both function to maintain/improve water quality. Both ultimately drain to the Kennebec and attenuate floodwaters by temporarily storing storm water runoff resulting in enhanced sediment and shoreline stabilization as well as nutrient removal and sediment retention. A summary of the functions and values for the wetlands on LJPT appears in Table 2.1.

TABLE 2-1 SUMMARY OF FUNCTIONS AND VALUES OF WETLANDS ON THE 109.77-ACRE LITTLE JIMMIE POND-HARWOOD TRACT

FUNCTION / VALUE	EXPLANATION
Groundwater Recharge/Discharge (GW)	Groundwater recharge was noted as a primary function for the black spruce bog in the west parcel of LJPT as well as in the smaller isolated, seasonally flooded wetlands located throughout the Tract. Groundwater discharge was noted in the forested wetlands that are connected to the large emergent marsh in the east parcel as well as the black spruce bog and larger wetland system off-site to the west of LJPT.
Flood flow Alteration (FF)	The most recent FIRM for this part of Manchester (Community Panel Nos. 23011 C0494D, C0513D effective date June 6, 2011), prepared FEMA identify a 100-year floodplain associated with Inlet Stream that encompasses the wetland southward from Collins Road to Hutchinson Pond (HP). On the west side of the parcel, wetlands are hydrologically connected to HP, and therefore also contribute to the function of flood flow alteration.
Fish and Shellfish Habitat (FH)	Surveys conducted by MDIFW indicate HP has abundant warm water fish habitat, principally for not only chain pickerel but also as a sport fishery for largemouth bass. Other species reported to occur in HP include white and yellow perch, pumpkinseed sunfish, baitfish and American eel. Brook trout are also stocked annually in Jimmie Pond to the north of the parcel and likely migrate south into Hutchinson Pond during spring and fall when water temperatures are adequate.
Production Export (PE)	The diverse vegetation observed on site provides plentiful seed and fruit sources for various species of wildlife. The eight vernal pools identified on site are also an important source of nutrient production and export within the local ecological system.
Sediment/Toxicant/ Pathogen Retention (STPR)	Open water and emergent marsh habitats in the west parcel have suitable organic and/or fine grain soils, slow moving water, variable water depths, flood storage capacity, and dense vegetation that are important and effective aspects of sediment, toxicant, and pathogen retention. The organic soils and long duration water retention time present in the black spruce bog in the west parcel also are important factors in sediment, toxicant, and pathogen reduction.
Nutrient Removal (NR)	Organic soils and dense vegetation in both the emergent marsh and black spruce bog on the LJPT are effective in performing this function. Storm water runoff from uplands and small ephemeral streams that drain into the wetlands is dissipated within the organic soils and dense vegetation where nutrients carried with the runoff are processed into other forms and transferred to higher trophic levels in the ecosystem.
Sediment/Shoreline Stabilization (SS)	The emergent marsh in the east parcel is in a mapped floodplain and contains a riparian buffer area comprised of scrub-shrub wetland that transitions into forested wetland. The wetlands around the perimeter of the marsh are an important component of floodwater attenuation and help to provide overall stability for downstream water resources such as HP.
Wildlife Habitat (WH)	Wetlands on the LJPT are comprised of a diverse mix of vegetative communities, wetland classes, and water regimes. The variety and lifeforms of vegetation provide suitable habitat for a multitude of birds, reptiles, amphibians, insects, and mammals. Moderate value IWWH (ID 031056) in the large marsh on the east parcel provides outstanding habitat for these species of birds. DWA is also identified on BWH maps in the forested area between the east and west parcels (Figure 2.2). Upland areas associated with the wetlands provide additional habitat for various species which utilize a mix of wetland and upland habitats or those that typically utilize uplands as their primary habitat.
Educational/ Scientific Value (ED)	Wetlands on the LJPT are diverse and would therefore provide ample opportunities for ecological education and learning. The property is close to the greater Augusta area, as well as WMA to the north and an existing conservation land parcel to the south. The quality and type of wetlands on the property, soil types, diverse vegetation communities, and presence of numerous vernal pools would provide a vast array of educational opportunities for the public.
Recreation (REC)	LJPT has access opportunities from Collins Road. Numerous recreational opportunities are available on the property including, fishing, hunting, hiking, boating, and bird watching

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2.8 Compensation

As part of the compensation package for NECEC, the approximately 109.77-acre Little Jimmie Pond Tract will be permanently protected by a conservation easement or similar instrument. Preservation of this property will include 66.97 acres of diverse wetland habitat, 3,030 linear feet of streams, nine vernal pools, and 81.24 acres of vernal pool critical terrestrial habitat (Figure 2.3). Considering the Tract's proximity to Augusta, current zoning, road frontage, and available upland area, LJPT is at risk of development for residential housing and the potential associated adverse impacts. Preservation of the Tract will allow for permanent protection from development and will preserve the existing recreational opportunities, wildlife habitat, water quality benefits, vernal pool habitat, and educational opportunities of LJPT.

2.9 Photographs

PHOTO 2-1 THE EMERGENT MARSH (PEM) ON THE EASTERN SIDE OF PARCEL IS PART OF THE IWWH

PHOTO 2-2 RECENT BEAVER ACTIVITY FLOODS THIS SECTION OF EMERGENT MARSH

PHOTO 2-3 WESTWARD VIEW OF EMERGENT/SCRUB-SHRUB WETLAND (PEM/PSS), ANOTHER WETLAND COVER TYPE OF THE IWWH ON THE EAST PARCEL

PHOTO 2 A FORESTED WETLAND (PFO4/1) IS LOCATED WEST OF THE LARGE PEM

PHOTO 2-5 A BLACK SPRUCE BOG (PFO4/1) IS LOCATED ON THE WEST PARCEL OF LJPT

PHOTO 2-6 THIS FLOODED SECTION OF FORESTED WETLAND OCCURS ALONG THE WESTERN PROPERTY BOUNDARY

PHOTO 2-7 THIS POTENTIALLY SIGNIFICANT VERNAL POOL (PSVP-1) OCCURS ON THE NORTH SIDE OF THE WEST PARCEL.

PHOTO 2-8 THIS POTENTIALLY SIGNIFICANT VERNAL POOL (PSVP-2) IS LOCATED ON THE EAST PARCEL

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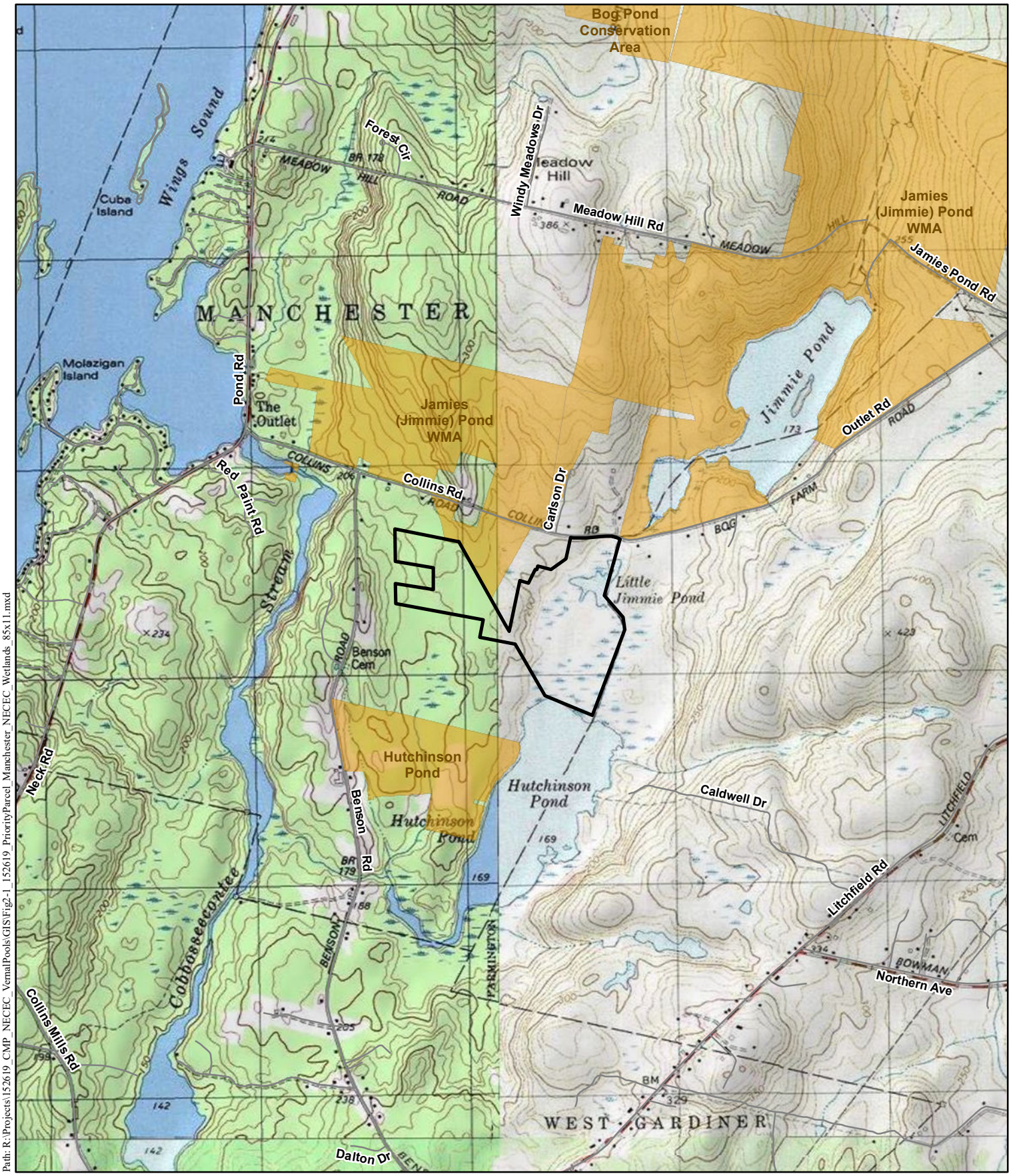

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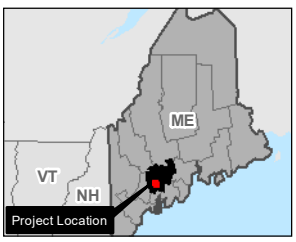

Road
Conserved Lands
Survey Boundary

N
W E
S

SCALE: 1 " = 2,000 '

0 1,000 2,000
Feet

Figure 2.1: Locus
Little Jimmie Pond
Harwood Tract

Kennebec County
Maine

Date:8/6/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

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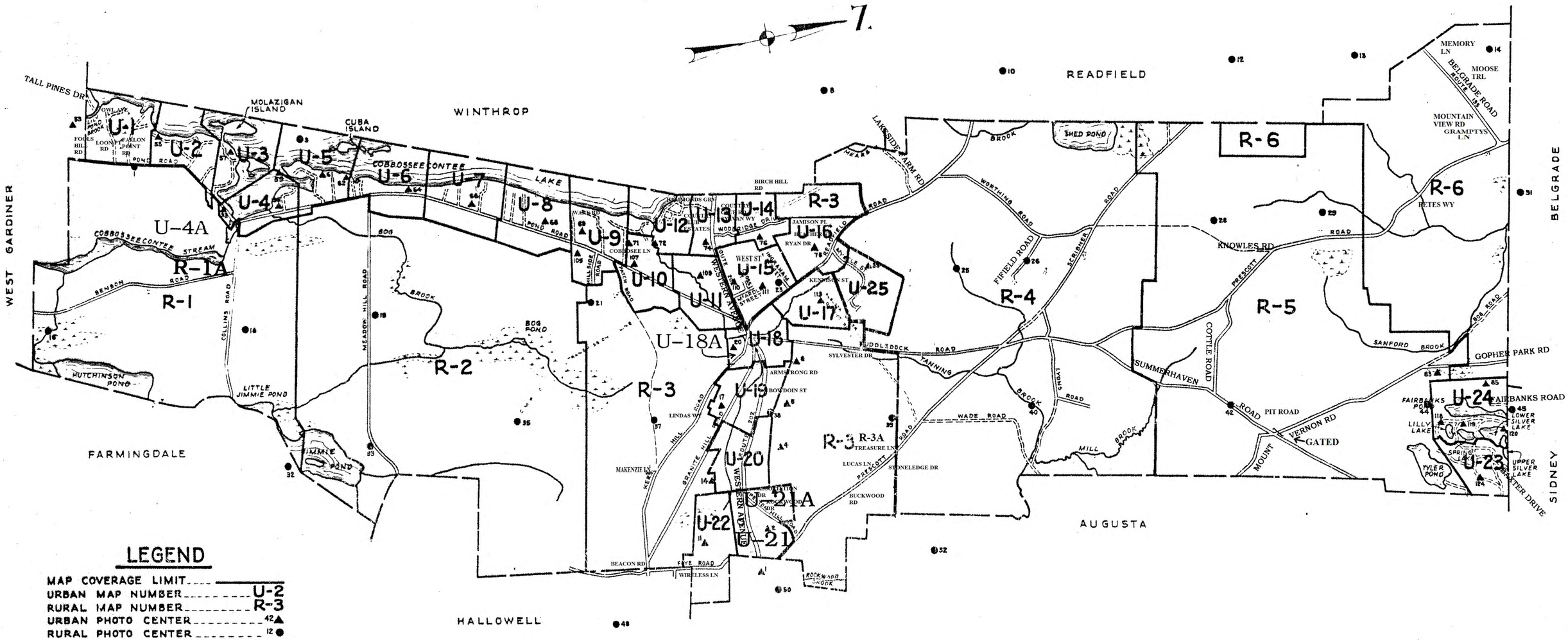

PREPARED BY
WRIGHT & PIERCE
CONSULTING ENGINEERS
TOPSHAM, MAINE
1968

MANCHESTER
MAINE

PROPERTY MAP
MANCHESTER, MAINE
APRIL 1, 2016

INDEX

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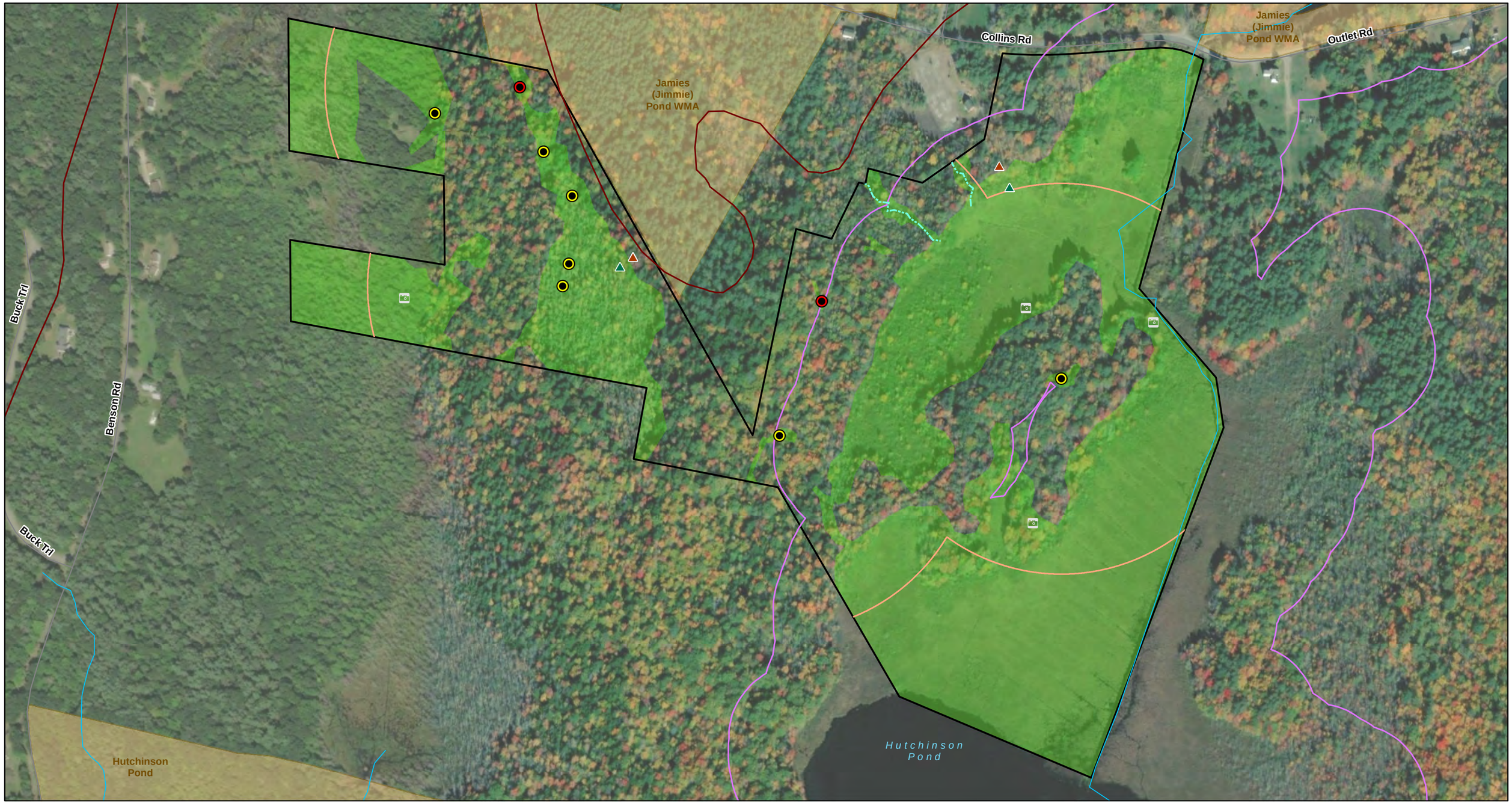

- Wetland Data Point
- Upland Data Point
- Potential Significant Vernal Pool
- Vernal Pool
- Photograph
- Delineated Ephemeral Stream
- Stream (NHD)
- Critical Terrestrial Habitat (750')
- DeerWinteringAreas
- Inland Waterfowl and Wading Bird Habitat
- Survey Area
- Road
- Delineated Wetland
- Conservation Land

Figure 2.3: Natural Resources
Little Jimmie Pond - Harwood Tract

Manchester Township, Kennebec County, Maine

0 175 350 700
Feet

1 " = 350 '

Page 1 of 1

Central Maine Power
NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

Date: 8/8/2018; Author: KK; Project: 152619

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APPENDIX 2A IPAC RESULTS: LITTLE JIMMIE POND–HARWOOD TRACT

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Project information

NAME

Compensatory Mitigation

LOCATION

Kennebec County, Maine

DESCRIPTION

Manchester

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 04431

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

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. 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.

The following species are potentially affected by activities in this location:

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Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon Salmo salar There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Evening Grosbeak Coccothraustes vespertinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Olive-sided Flycatcher Contopus cooperi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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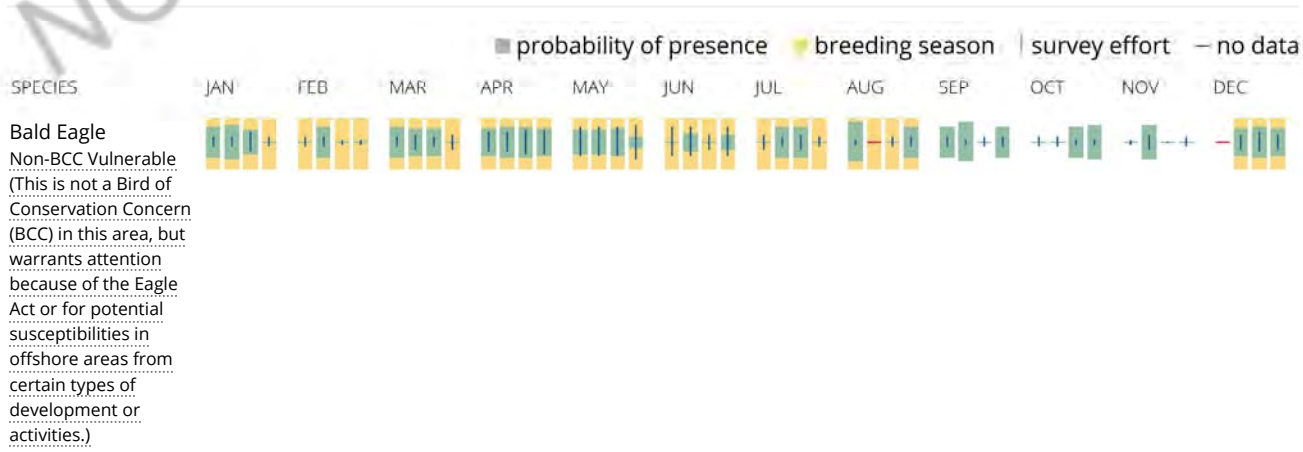
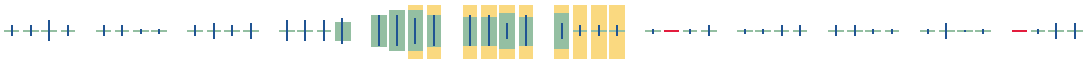


Black-billed Cuckoo
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

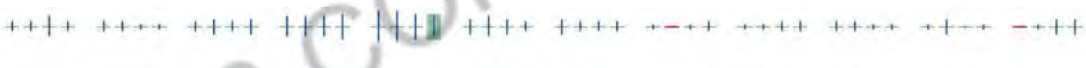
Bobolink
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Canada Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

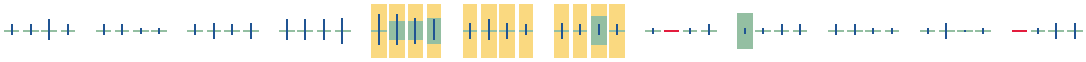
Evening Grosbeak
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Lesser Yellowlegs
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Olive-sided Flycatcher
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



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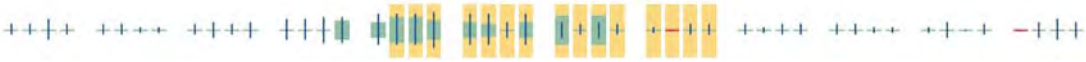
Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

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To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in

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knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

- PFO4E
- PFO4/1B
- PSS1E
- PFO1E
- PFO4/1E

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FRESHWATER POND

PUBHh

LAKE

L1UBH

RIVERINE

R2UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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APPENDIX 2B VEGETATION LIST: LITTLE JIMMIE POND–HARWOOD TRACT

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Abies balsamea	Balsam Fir	Pinaceae	FAC
Acer pennsylvanicum	Striped Maple	Aceraceae	FACU
Acer rubrum	Red Maple	Aceraceae	FAC
Alnus incana ssp. *rugosa*	Speckled Alder	Betulaceae	FACW
Aralia nudicaulis	Sarsaparilla	Araliaceae	FACU
Betula alleghaniensis	Yellow Birch	Betulaceae	FAC
Betula papyrifera	Paper Birch	Betulaceae	FACU
Betula populifolia	Gray Birch	Betulaceae	FAC
Calamagrostis canadensis	Bluejoint	Poaceae	OBL
Carex canescens	Silvery Sedge	Cyperaceae	OBL
Carex crinita	Fringed Sedge	Cyperaceae	OBL
Carex flava	Yellow Sedge	Cyperaceae	OBL
Carex intumescens	Bladder Sedge	Cyperaceae	FACW
Carex stricta	Tussock Sedge	Cyperaceae	OBL
Carex tribuloides	Blunt Broom Sedge	Cyperaceae	FACW
Carex trisperma	Three-seeded Sedge	Cyperaceae	OBL
Carpinus carolinianus	Ironwood	Betulaceae	FAC
Coptis trifolia	Three-Leaf Goldthread	Ranunculaceae	FACW
Dendrolycopodium dendroideum	Prickly Club-Moss	Lycopodiaceae	FACU
Dryopteris intermedia	Evergreen Wood Fern	Dryopteridaceae	FAC
Eleocharis erythropoda	Red-Footed Spike sedge	Cyperaceae	OBL
Equisetum fluviatile	Water Horsetail	Equisetaceae	OBL
Equisetum sylvaticum	Woodland Horsetail	Equisetaceae	FACW
Fagus grandifolia	American Beech	Fagaceae	FACU
Fraxinus americana	White Ash	Oleaceae	FACU
Fraxinus pennsylvanica	Green Ash	Oleaceae	FACW
Galium asprellum	Rough Bedstraw	Rubiaceae	OBL
Galium palustris	Marsh Bedstraw	Rubiaceae	OBL
Glyceria striata	Fowl Manna Grass	Poaceae	OBL
Hamamelis virginiana	American Witch-Hazel	Hamamelidaceae	FACU
Ilex verticillata	Common Winterberry	Aquifoliaceae	FACW
Impatiens capensis	Jewelweed	Balsaminaceae	FACW
Iris versicolor	Blue-Flag Iris	Iridaceae	OBL
Juncus effusus	Common Soft Rush	Juncaceae	OBL
Lemna minor	Common Duckweed	Lemnaceae	OBL
Lysimachia borealis	Starflower	Myrsinaceae	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Maianthemum canadense	Canada Mayflower	Ruscaceae	FACU
Medeola virginiana	Indian Cucumber-Root	Liliaceae	FACU
Onoclea sensibilis	Sensitive Fern	Onocleaceae	FACW
Osmunda claytonia	Interrupted Fern	Osmundaceae	FAC
Osmunda regalis var. *spectabilis*	Royal Fern	Osmundaceae	OBL
Osmundastrum cinnamomeum	Cinnamon Fern	Osmundaceae	FACW
Oxalis montana	Northern Wood Sorrel	Oxalidaceae	FACU
Parathelypteris novaboracenis	New York Fern	Thelypteridaceae	FAC
Picea mariana	Black Spruce	Pinaceae	FACW
Pinus strobus	Eastern White Pine	Pinaceae	FACU
Pteridium aquilinum	Bracken Fern	Dennstaeditaceae	FACU
Quercus rubra	Red Oak	Fagaceae	FACU
Rhododendron groenlandicum	Labrador Tea	Ericaceae	OBL
Rubus pubescens	Dwarf Red Raspberry	Rosaceae	FACW
Salix nigra	Black Willow	Salicaceae	OBL
Scirpus cyperinus	Common Woolsedge	Cyperaceae	OBL
Sparganium sp.	Bur-reed	Typhaceae	OBL
Spiraea alba var. *latifolia*	Meadowsweet	Rosaceae	FACW
Spiraea tomentosa	Steeplebush	Rosaceae	FACW
Streptopus lanceolatus	Rose Twisted Stalk	Liliaceae	FACU
Symphyotrichum sp.	American Aster	Asteraceae	N/A
Thelypteris palustris	Marsh Fern	Thelypteridaceae	FACW
Tsuga canadensis	Eastern Hemlock	Pinaceae	FACU
Toxicodendron radicans ssp. *radicans*	Poison-Ivy	Anacardiaceae	FAC
Ulmus americana	American Elm	Ulmaceae	FACW
Viburnum dentatum	Smooth Arrowwood	Adoxaceae	FAC
Viburnum lantanoides	Hobblebush	Adoxaceae	FACU
Viola sp.	Violet	Violaceae	N/A
INDICATOR STATUS	OCCURRENCE IN WETLANDS (% per Reed, 1998)		
Obligate (OBL)	Almost always occurs in wetlands under natural conditions (99%)		
Facultative Wetland (FACW)	Usually in wetlands, occasionally found in non-wetlands (67- 99%)		
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands. (33-67%)		
Facultative Upland (FACU)	Usually in non-wetlands, occasionally found in wetlands (1-33%)		
Upland (UPL)	Almost always in non-wetlands under natural conditions (1%)		

[1] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17.USACE National Wetland Plant List. Web.20 June 2018.

[2] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TN-12-1, USACE Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at https://www.fws.gov/wetlands/documents/national-wetland-plant-list-indicator-rating-definitions.pdf [Verified 20 June 2018]
*Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands.* Washington, DC, USFWS.

3.0 FLAGSTAFF LAKE TRACT

3.1 Site Location Information

Municipalities: Carrying Place and Dead River Townships **County:** Somerset

Biophysical Region: Western Mountains

Watershed (HUC 12): West Carry Pond-Flagstaff Lake (010300020304)

NECEC Components within HUC 8 (01030000) Watershed: HVDC, New ROW

Closest NECEC Component: HVDC, Existing Right of Way

Coordinates of Site Centroid (Lat/Long WGS 84): 45°11'11.48"N, 70°9'42.41"W

3.2 Natural Resource Inventory Summary (quantities are +/-):

Total Site Area .....831.39 acres

NWI Palustrine Wetland Area.....82.48 acres

Delineated and GPS-surveyed Palustrine Wetland Area….....423.96 acres

NHD Rivers and Streams.....10,580 feet (2.00 miles)

Delineated and GPS-surveyed Rivers and Streams..... .....10,790 feet (2.04 miles)

Upland Area..... 407.43 acres

Inland Wading Bird and Waterfowl Habitat (High Value) ……. 28.88 acres

Significant Vernal Pools……... None

Non-Significant Vernal Pool Types…… 4 medium value VPs; 3 medium value, 4 medium/low value and 2 low value CVPs; 39 PVPs (hundreds in skidder ruts not GPS-surveyed)

Vernal Pool Critical Terrestrial Habitat……..... 232.28 acres

3.3 Site Description

The approximately 831.39-acre Flagstaff Lake Tract (hereafter "FLT" or "the Tract") is located along approximately 8.5 miles of the east shore of Flagstaff Lake (Photo 3.1) where the boundary corresponds to the 1,050 feet mean sea level (MSL) topographic contour. The east boundary is the paved, Long Falls Dam Road. Most of the Tract occurs in Carrying Place Township; however, the northern tip and west side of the central and southern peninsulas are located in Dead River Township (Figure 3.1).

With the exception of a shore side, seasonal cabin located where the shoreline is closest to Long Falls Dam Road (Photo 3.2) and the Maine Huts & Trail (MHT) lodge on the central peninsula that supports and lodges hikers over the approximately 3.0-mile MHT network crossing the property, the Tract is essentially undeveloped. FLT lies between, and therefore links, the Maine Bureau of Parks and Land (MBPL) 854-acre Dead River Peninsula property with its public boat ramp on the north and 3,600 acres of public land making up the Bigelow Preserve on the south and the opposite shore of Flagstaff Lake. The

view focal point from the Tract is Bigelow Mountain (elevation of 4,150 feet), which is designated as a National Natural Landmark by the United States Department of Interior.

3.4 Surrounding Land Use, Protected Open Space and Focus Areas

FLT is displayed on Figure 3.2, MLUPC's Land Use Guidance Map for Carrying Place Town Twp. (T2 R3 BKP WKR). Most of FLT is designated as the Management Subdistrict General (M-GN). In addition, the following Protection Subdistricts occur at FLT:

- P-AL – Accessible Lake
- P-GP – Great Pond
- P-SL1 – Shoreland Areas within 250 feet of the normal high-water mark
- P-SL2 – Shoreland Areas within 75 feet of the normal high-water mark
- P-UA – Unusual Area
- P-WL2 – scrub shrub and other nonforested wetlands
- P-WL3 – forested wetlands (excluding those covered under PWL-1, PWL-2)

Although not subject to formal protective instruments, FLT lies wholly within the 50,000 acre Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area of Statewide Ecological Significance (https://www.maine.gov/dacf/mnap/focusarea/bigelow_mountain_focus_area.pdf) as identified by MNAP, MDIFW, MDMR, USFWS, TNC, Maine Audubon, and the Maine Coast Heritage Trust. This classification is based on the abundance of recreational opportunities, natural features and landscapes of exceptional ecological value.

Historical significance on and around FLT include The Great Carrying Place, Benedict Arnold's expedition portage route from The Kennebec, through East, Middle, and West Carry Ponds to Flagstaff Lake. This trail was made and used by Native Americans thousands of years before the 1775 expedition led by Arnold. Early in the Revolutionary War his 1,100-man army carried boats weighing hundreds of pounds along with food and supplies over this portage for an ill-fated sneak attack on Quebec. The trail adds uniqueness and historic value to the already existing beauty of the Flagstaff Lake region (http://matlt.org/hike/arnold-expedition-appalachian-trail-hike).

3.5 Wildlife Use

Wildlife usage and habitat evaluations on FLT were conducted based on field surveys, aerial photograph interpretation of landscape and terrain, and research of IPaC results from the USFWS for endangered species, critical habitat, migratory birds, and fisheries (Appendix 3A). FLT's size and wide variety of habitat makes it an ideal home for many species of fauna to thrive. The tract contains an abundance of mixed coniferous-deciduous forest suitable for many mammals, birds, and amphibians. FLT provides numerous palustrine wetland habitats including forested (PFO), emergent (PEM), and scrub-shrub (PSS) wetlands, intermittent and perennial streams flowing to Flagstaff Lake, as well as the Lake itself. As mentioned above, the entirety of FLT is within the Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area, an acclaimed recreational destination that encompasses a wide range of natural features and exceptional ecological value.

Rare animals within the Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area likely to be found on FLT include: bald eagle (*Haliaeetus leucocephalus*), the mussel commonly known as creeper (*Strophitus undulates*), and Canada lynx (*Lynx canadensis*) (BWH 2018b). FLT is an attractive site for a variety other of mammals including, but not limited to: beaver (*Castor canadensis*), white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*), black bear (*Ursus americanus*), red fox (*Vulpes vulpes*), Eastern gray squirrel (*Sciurus carolinensis*) and red squirrel (*Sciurus vulgaris*). Coyote (*Canis latrans*), mink (*Neovison vison*), river otter (*Lontar canadensis*), fisher (*Pekania pennanti*) and pine marten (*Martes americana)* are other furbearers that inhabit or traverse the Tract.

Several Birds of Conservation Concern (BCC) listed in the IPaC report are present in and around FLT; these BCCs are the Canada warbler (*Cardellina canadensis*), the Cape May warbler (*Setophaga tigrina*), evening grosbeak (*Coccothraustes vespertinus*), olive-sided flycatcher (*Contopus cooperi*), rusty blackbird (*Euphagus carolinus*), wood thrush (*Hylocichla mustelina*) and peregrine falcon (*Falco peregrinus*). FLT is an ideal habitat area for bald eagles (*Haliaeetus leucocephalus*) with an abundance of food sources in Flagstaff Lake and tall trees for perching and nesting. The Tract contains a 35-acre high value IWWH (ID UMO-9951) comprised of scrub-shrub and emergent sedge wetlands with several beaver dams creating open water areas. In addition, the IWWH is also a highly productive habitat for other species of birds as well as mammals, fish, and amphibians.

Several other bird species were observed on the Tract during field surveys including common raven (*Corvus corax*), black-capped chickadee (*Poecile atricapillus*), American woodcock (*Scolopax minor*), and wild turkey (*Meleagris gallopavo*). Common loons (*Gavia immer*) were observed swimming and fishing near the shore of Flagstaff Lake and a constructed, protective loon nesting raft was found washed ashore near the tip of the northernmost peninsula on the southern third of the Tract. Previously logged areas are abundant with red and black raspberry (*Rubus* spp.) and low bush blueberry *(Vaccinium angustifolium*) providing soft mast for many passerine bird species and mammals.

A variety of amphibian species inhabit FLT wetlands. During field surveys, adult and juvenile American toads (*Anaxyrus americanus*), green frogs (*Lithobates clamitans*), and wood frogs (*Lithobates sylvaticus*) were observed. Spotted salamander (*Ambystoma maculatum*) egg masses were observed throughout the Tract, generally in hundreds of man-made pools such as skidder ruts and borrow pits (identified as CVPs 9 of which are of medium to low value). Four, medium values natural vernal pools (VP) and at least 39 potential vernal pools (PVP) with and without wood frog and salamander egg masses were found on the Tract.

3.6 Vegetation

The Tract consists of a variety of vegetative communities which provide different cover types, habitat characteristics, and ecological functions. The property is primarily composed of forest, portions of which include mature mixed coniferous-deciduous forests and early successional forest regeneration. There are also large areas of scrub-shrub swamps, emergent marshes, and beaver-impounded open water areas.

Wetlands and uplands were identified in the mixed coniferous-deciduous forests on the Tract, and their natural community types were identified as evergreen seepage forest, spruce-fir wet flats, and low elevation spruce-fir forest respectively. Dominant tree species in the evergreen seepage forests are northern white cedar (*Thuja occidentalis*) with occasional frequency of red spruce (*Picea rubens*). Common understory species include goldthread (*Coptis trifolia*), bunchberry (*Chamaepericlymenum*

canadense), and twinflower (*Linnaea borealis*). Dominant tree species in the spruce-fir wet flats are balsam fir (*Abies balsamea*) and red spruce with the occasional frequency of red maple (*Acer rubrum*) and yellow birch (*Betula alleghaniensis*). Common understory plants found are cinnamon fern (*Osmundastrum cinnamomeum*), three-seeded sedge (*Carex trisperma*), bunchberry, and Canada mayflower (*Maianthemum canadense*). Common bryophytes are *Sphagnum* mosses. Dominant tree species in the upland forest are balsam fir, red spruce, and eastern white pine (*Pinus strobus*). The shrub stratum contains saplings of the above mentioned tree species and dwarf shrub low-bush blueberry (*Vaccinium angustifolium*).

Early successional forest regeneration on site corresponds with impacts related to historic commercial timber harvest. Often these impacted areas include dense regeneration stands of balsam fir, red spruce, quaking aspen (*Populus tremuloides*), red maple, and paper birch (*Betula papyrifera*) with occasional residual overstory. The shrub layer in this system is dominated by the above mentioned tree saplings and includes sporadic populations of striped maple (*Acer pennsylvanicum)*. The herbaceous stratum in this zone is dominated by red raspberry (*Rubus idaeus*), an opportunistic species quick to colonize after disturbance, nodding sedge (*Carex gynandra*) (typically more abundant in the pooled-up water areas associated with skidder ruts), and bracken fern (*Pteridium aquilinum*).

Scrub-shrub swamps (PSS) on the property are associated with stream banks and the shoreline of the lake, typically most abundant where these two types of systems converge. Dominant woody species include speckled alder (*Alnus incana* ssp. *rugosa*) and meadowsweet (*Spiraea alba* var. *latifolia*), as well as balsam fir, northern white cedar and red maple saplings. Dominant woody vegetation along the shoreline of the lake includes speckled alder, meadowsweet, and sweet gale (*Myrica gale*). Dominant understory plants include sensitive fern (*Onoclea sensibilis*), Canada mayflower, tall meadow-rue (*Thalictrum pubescens*), swamp dewberry (*Rubus hispidus*), and violets (*Viola* spp.).

At several locations throughout this property are open-water beaver impounded areas. As a result of the hydrologic modification from the beaver activity, standing dead red spruce and northern white cedar snags occupy the flooded area. On the periphery of the open water, speckled alder is the dominant shrub. Emergent vegetation includes a suite of sedges (*Carex* spp.), bulrushes (*Scirpus* spp.), and other graminoids.

3.7 Wetland Characteristics, Functions and Values

Adjoining the approximately 32-square-mile Flagstaff Lake (L1UB), approximately 424 acres (51%) of the 831.39-acre FLT were identified as palustrine wetland during field surveys (Figure 3.3). The primary wetland type on this Tract is palustrine forested (PFO) with a mix of evergreen (4) and deciduous vegetation (1) (Photo 3.3). Variations of forested wetland occur across FLT such as ones dominated by dead snags (PFO5) readily conspicuous along Lower Falls Dam Road to the north of Pond Stream and in large areas impounded by beaver dams (Photo 3.4). PFO also occurs as discrete relatively undisturbed stands in areas selectively harvested for timber resulting in localized ponding of water and establishment of associated herbaceous emergent dominated (PEM) wetlands (Photo 3.5). The second most abundant wetland type at FLT is palustrine scrub-shrub (PSS1) and occurs in areas regenerating from timber harvesting, beaver flowages and along the lake edge and riparian areas (Photo 3.6).

The third most abundant wetland type at FLT are differing forms of PEM which, as previously noted, occur in localized areas harvested for timber around ponded skidder ruts as well as in less disturbed settings (Photo 3.7). The PEM dominated wetland along an unnamed stream south of Pond Stream (Photo 3.8) is also the primary reason this wetland is designated as a high value IWWH (Figure 3.3) by MDIFW.

Presence of emergent wetland also contributes to vegetative diversity in the widespread, smaller scale vernal pools (Photo 3.9) and in the hundreds of PVPs, CVPs or ABAs associated with skidder ruts.

Mineral soils at FLT are generally derived from dense lodgment or basal till parent material, however as displayed in eroding bluffs along segments of the east shore of Flagstaff Lake, well sorted fine sands suggest there are localized areas of the Tract where soils originate from a cap of eolian sediments most likely wind deposited after glacial retreat and prior to establishment of vegetation. Organic soils originated from accumulation of vegetation in water such as along the major stream courses and in larger, somewhat isolated wetlands such as the PFO that dominates the south side of FLT's central peninsula.

As mapped by the USDA NRCS on Web Soil Survey, approximately 25 to 29 percent or between 205 to 240 acres of FLT is underlain by poorly drained (PD), or very poorly drained (VPD) hydric soils that are characteristic of wetlands. Map Unit Name and Symbols for hydric soils at FLT include:

- Bucksport and Wonsqueak mucks (WO) – VPD organic soils derived from vegetation deposited in water.
- Pillsbury-Peacham association (PPB) – PD fine to coarse loams derived from lodgment till.

Bucksport and Wonsqueak mucks are the hydric soils mapped to be most extensive and predominantly occur along the main drainages of the site (e.g., Pond Stream and Jerome Brook).

The sensitively sited, well maintained and highly used Maine Huts and Trails network enables all wetland types on FLT and their related functions and values to be observed and enjoyed by the public (Photo 3.10).

TABLE 3-1 SUMMARY OF FUNCTIONS AND VALUES OF WETLANDS ON THE 831.39-ACRE FLAGSTAFF LAKE TRACT

FUNCTION/VALUE	EXPLANATION
Groundwater Recharge/Discharge (GW)	Although there are no MGS mapped sand and gravel aquifers on FLT proper, an esker at the south end of the Lake is identified as a Significant Sand and Gravel Aquifer (MGS OF No. 01-132). Being part of the surface hydrologic system, wetlands on FLT draining into the Lake therefore recharge this down gradient aquifer.
Flood flow Alteration (FF)	Dead River and Carrying Place Twps are designated as "no data/No Specific Flood Hazard Area" (USGS OF Rpt 2006-1100), however water levels along the Dead River are actively managed at the Long Falls Dam outlet of Flagstaff Lake by Brookfield Renewable Energy. In relation to these fluctuating water levels, a principal function of wetlands on the Flagstaff Lake parcel that are along and hydrologically connected to the Flagstaff Lake is Floodflow Alteration.
Fish and Shellfish Habitat (FH)	Landlocked salmon, brook trout, yellow perch, chain pickerel and an assortment of baitfish inhabit Flagstaff Land and although marginal for cold water gamefish (MDIFW 1988) in 2017 it was stocked with approximately 3,400, 7- to 8-inch landlocked salmon and brook trout to support the Lake fishery for recreational anglers (MDIFW 2018). Freshwater mussels observed downstream along muddy shorelines of the Dead River are also likely to inhabit similar substrate in Flagstaff Lake.
Production Export (PE)	As evidenced by browse, droppings and other sign, woody vegetation in FLT wetlands is a fundamental food source for all herbivorous and omnivorous wildlife inhabiting the Tract. Seeds, roots and stems from herbaceous vegetation in not only PEM but PSS and PFO wetlands on FLT are also food sources for not only mammals, but the wide variety of birds, amphibians, reptiles, fish and insects that inhabit or traverse the Tract.
Sediment/Toxicant/ Pathogen Retention (STPR)	Micro-topography as well as woody and herbaceous vegetation throughout FLT wetlands physically slow surface water transport and retain these degraders of water quality to Flagstaff Lake as well as lesser tributaries. Sediments/toxicants/pathogens trapped with accumulation of vegetative remains as peat or other forms of hydric soils is another form of FLT wetlands protecting water quality of tributary streams and Flagstaff Lake.
Nutrient Removal (NR)	Micro-topography as well as woody and herbaceous vegetation throughout FLT wetlands slow surface water transport of phosphorus adhering to sediment protecting Flagstaff Lake as well as lesser tributaries from eutrophication water quality degradation . Direct uptake of nutrients by wetland vegetation and subsequent accumulation of dead vegetation in organic soils and peat is another pathway of FLT wetlands protecting water quality.
Sediment/Shoreline Stabilization (SS)	Due to the large westward fetch of Flagstaff Lake, lacustrine and palustrine vegetated wetlands aligned along the east shore of the lake buffer and protect the adjoining shoreline from prevailing wind generated waves. Palustrine wetlands along named as well as unnamed streams crossing FLT also stabilize adjoining upland and uplands thereby limiting and protecting lake degradation.
Wildlife Habitat (WH)	In addition to direct observation as well as tracks, droppings and other sign, moose, bear, deer, beaver, otter, mink and other smaller mammals are abundant on FLT that is further enhanced by the presence of a high rated IWWH (ID UMO-9951) near the center (Photo 3.8) of the Tracts. As described in detail above, FLT provides high quality habitat for a wide variety of raptors, waterfowl, gamebirds, passerines songbirds, amphibians, reptiles and insects.
Educational/ Scientific Value (ED)	FLT recognized for its research and educational opportunities as an integral component of the Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area of Statewide Ecological Significance (https://www.maine.gov/dacf/mnap/focusarea/bigelow_mountain_focus_area.pdf) including being crossed by a segment of the Great Carrying Place/Arnold's Trail.
Recreation (REC)	FLT is at the crossroads of the MHT, Appalachian and Northern Forest Canoe Trail network traveled by day, and through hikers and is also used for camping, cross country skiing and snowshoeing (Photo 3.10). Fishing and boating are a widely used offering of Flagstaff Lake, and hunting opportunities are also provided by FLT.

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3.8 Compensation

As part of the compensation package for NECEC, the approximately 831.39-acre Flagstaff Lake Tract will be permanently protected by a conservation easement or similar instrument. Preservation of FLT along approximately 8.5 miles of the east shore of Flagstaff Lake will protect a currently unprotected link between the conserved Bigelow Preserve to the south and the Dead River Peninsula to the north (Figure 3.1). In addition, approximately half (424 acres) of FLT is comprised of a diverse mix of wetland types (PFO, PSS, PEM), at the center of which is a 28.88-acre high value IWWH. In addition to the lacustrine shoreline, approximately 10,790 linear feet of named and unnamed perennial and intermittent streams cross the Tract and are tributaries to Flagstaff Lake (Figure 3.3).

Notably, the well sited Maine Huts and Trails facility and a solitary cabin are presently the limit of residential type development at FLT. Considering that most of the Tract is zoned M-GN, with upland chiefly concentrated as sizable islands along the lake shore, FLT is therefore potentially easily accessible for other camp lots from the paved Long Falls Dam Road that forms the eastern boundary. Preservation of FLT will allow for permanent protection from development and will preserve the existing recreational opportunities, wildlife habitat, water quality benefits, vernal pool habitat, and educational opportunities of an integral component of the Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area of Statewide Ecological Significance.

3.9 Photographs

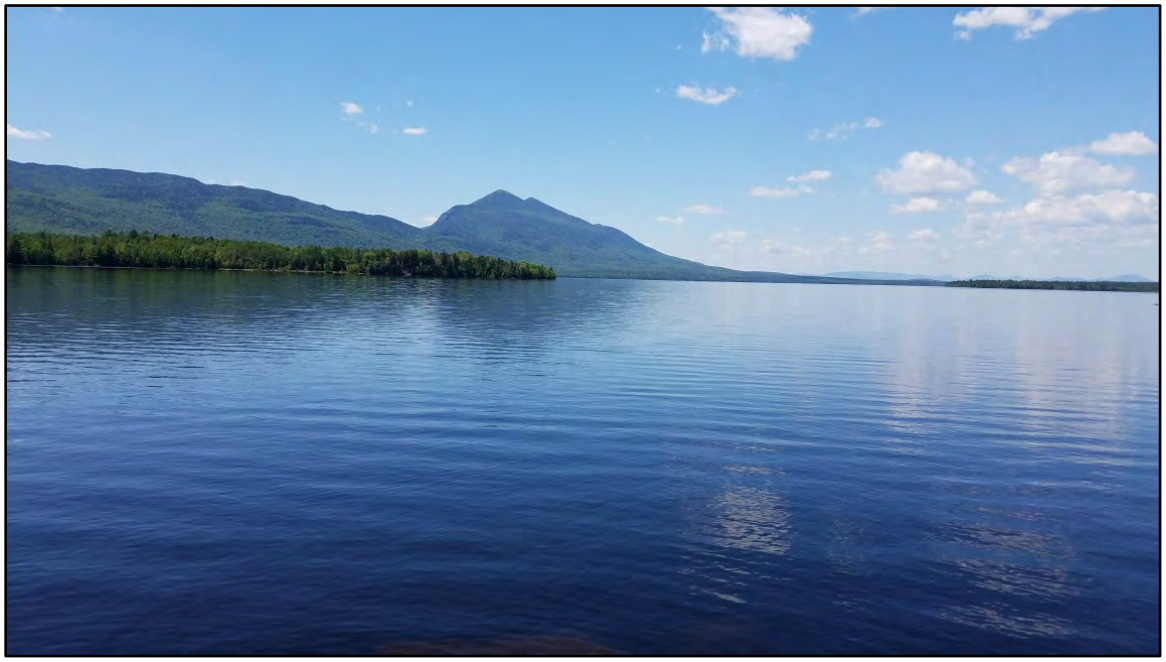

PHOTO 3-1 THE WESTWARD FOCAL POINT FROM FLT ACROSS FLAGSTAFF LAKE IS BIGELOW MOUNTAIN

PHOTO 3-2 THIS PRIVATELY-OWNED CABIN IS LOCATED ABOUT 125 FEET FROM WATER'S EDGE WHERE FLAGSTAFF LAKE IS APPROXIMATELY 450 FEET FROM LONG FALLS DAM ROAD

PHOTO 3-5 SKIDDER RUTS IN LOGGED AREAS COLLECT WATER BECOMING POTENTIAL VERNAL POOL HABITATS AND ALLOW EARLY SUCCESSIONAL REGENERATION

PHOTO 3-6 SCRUB-SHRUB WETLANDS (PSS) OCCUR THROUGHOUT FLT, ESPECIALLY NEAR THE LAKE EDGE AND IN RIPARIAN AREAS

PHOTO 3-3 FORESTED WETLANDS (PFO1/4) OF NORTHERN WHITE CEDAR (*THUJA OCCIDENTALIS*) AND SPHAGNUM MOSSES ARE THE DOMINANT FOREST TYPE ACROSS FLT

PHOTO 3-4 STANDING DEAD SNAGS (PFO5) RESULT FROM A BEAVER FLOWAGE ALONG THE SOUTHERN EDGE OF FLT

PHOTO 3-7 EMERGENT WETLANDS (PEM) HARBOR HIGH GRAMINOID DIVERSITY AND PROVIDE HABITAT FOR A WIDE VARIETY OF WILDLIFE

PHOTO 3-8 PONDED OPEN WATER AREAS WITHIN THE IWWH PROVIDE WILDLIFE HABITAT FOR A VAST RANGE OF WETLAND DEPENDENT BIRDS AND MAMMALS INCLUDING BEAVER

PHOTO 3-9 SPOTTED SALAMANDER EGG MASSES (ARROW) OCCUR IN A VERNAL POOL

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PHOTO 3-10 THE MAINE HUTS AND TRAILS NETWORK TRAVERSES THE FLT AND CONNECTS WITH THE ARNOLD TRAIL, NORTHERN CANOE TRAIL AND THE APPALACHIAN TRAIL

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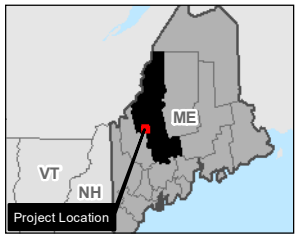

Road
Conserved Lands
Survey Boundary
Approximate Maine Huts and Trails Lease

N
W E
S

SCALE: 1 " = 3,000 '

0 1,500 3,000
Feet

Figure 3.1: Locus
Flagstaff Lake Tract

Somerset County
Maine

Date:8/6/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

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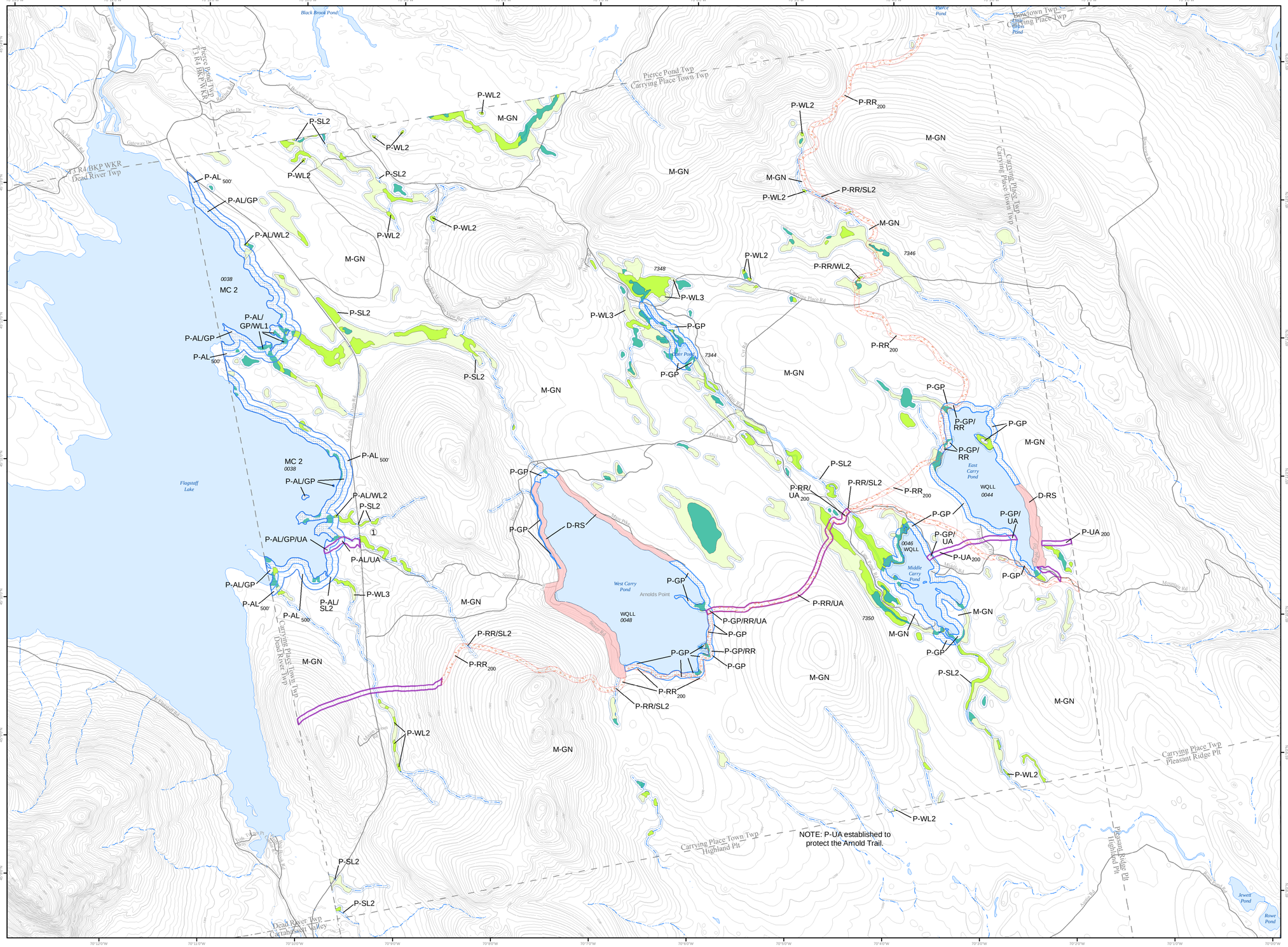
Carrying Place Town Twp.

T2 R3 BKP WKR

Somerset County



Land Use Guidance Map

Department of Agriculture, Conservation and Forestry

Maine Land Use Planning Commission

Legend

DEVELOPMENT SUBDISTRICTS

- D-RS: Residential

MANAGEMENT SUBDISTRICTS

- M-GN: General

PROTECTION SUBDISTRICTS

- P-AL: Accessible Lake
- P-GP: Great Pond
- P-RR200: Recreation - 200'
- P-SL2: Shoreland - 75'
- P-UA: Unusual Area
- P-WL1: Wetlands of Special Significance
- P-WL2: Scrub-shrub Wetlands
- P-WL3: Forested Wetlands

For complete descriptions of those areas included within the various subdistricts, and the associated regulations, refer to the Commission's Chapter 10 rules: Land Use Districts and Standards. Where any inconsistencies exist between the district boundaries, as shown on this map, and those described by the Commission's Land Use Districts and Standards, the latter shall govern.

For simplicity, this map does not show all the Wetland Protection Subdistricts for areas identified pursuant to Section 10.23,N,2 such as the beds of rivers, lakes, and other water bodies, and freshwater wetlands within 25 feet of stream channels. Nevertheless, these areas are within P-WL Subdistricts. In addition, this map does not show the Shoreland Protection Subdistricts along stream channels flowing through wetlands. Nevertheless, these areas are within P-SL2 Protection Subdistricts. If the locations of flowing waters or bodies of standing water existing on the ground differ from those shown on the map, then, pursuant to 12 M.R.S., Section 685-A(2)(G), P-GP, P-RR, P-SL, P-WL, and other subdistrict boundaries that are based upon the location of such waters shall, as appropriate, be deemed to follow the flowing water or body of standing water existing on the ground.

This Land Use Guidance Map was adopted by the Maine Land Use Planning Commission on **08/03/2005**, and became effective on **08/18/2005**.

This map is certified to be a true and correct copy of the Official Land Use Guidance Map of the Maine Land Use Planning Commission.

By: Catherine M Carroll, Director, Maine Land Use Planning Commission.

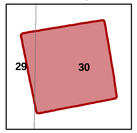
Amendments			
Location #	Zoning Permit	Effective Date	Remarks
1	ZP759	08/18/2005 06/29/2017	Adoption of digital NWI wetlands

0 0.5 1 1.5 2 Miles

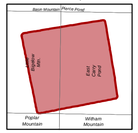
0 1,000 2,000 3,000 4,000 Meters

0 2,000 4,000 6,000 8,000 Feet

DeLorme map locus



USGS 7.5' quad index



(1) Map amendment location

▲ Point at which a river drains 25 square miles - symbol points upstream (12 M.R.S. Sec. 682-B(4))

9999 MIDAS number: Unique number assigned to each standing body of water in Maine.

WQLL Water Quality Limiting Lake - Refer to Section 10.23,E,3,g of the Commission's Land Use Districts and Standards.

MC# Lake Management Classes - Refer to Section 10.02 (Definitions) of the Commission's Land Use Districts and Standards.

SOURCES: Maine Land Use Planning Commission, USGS

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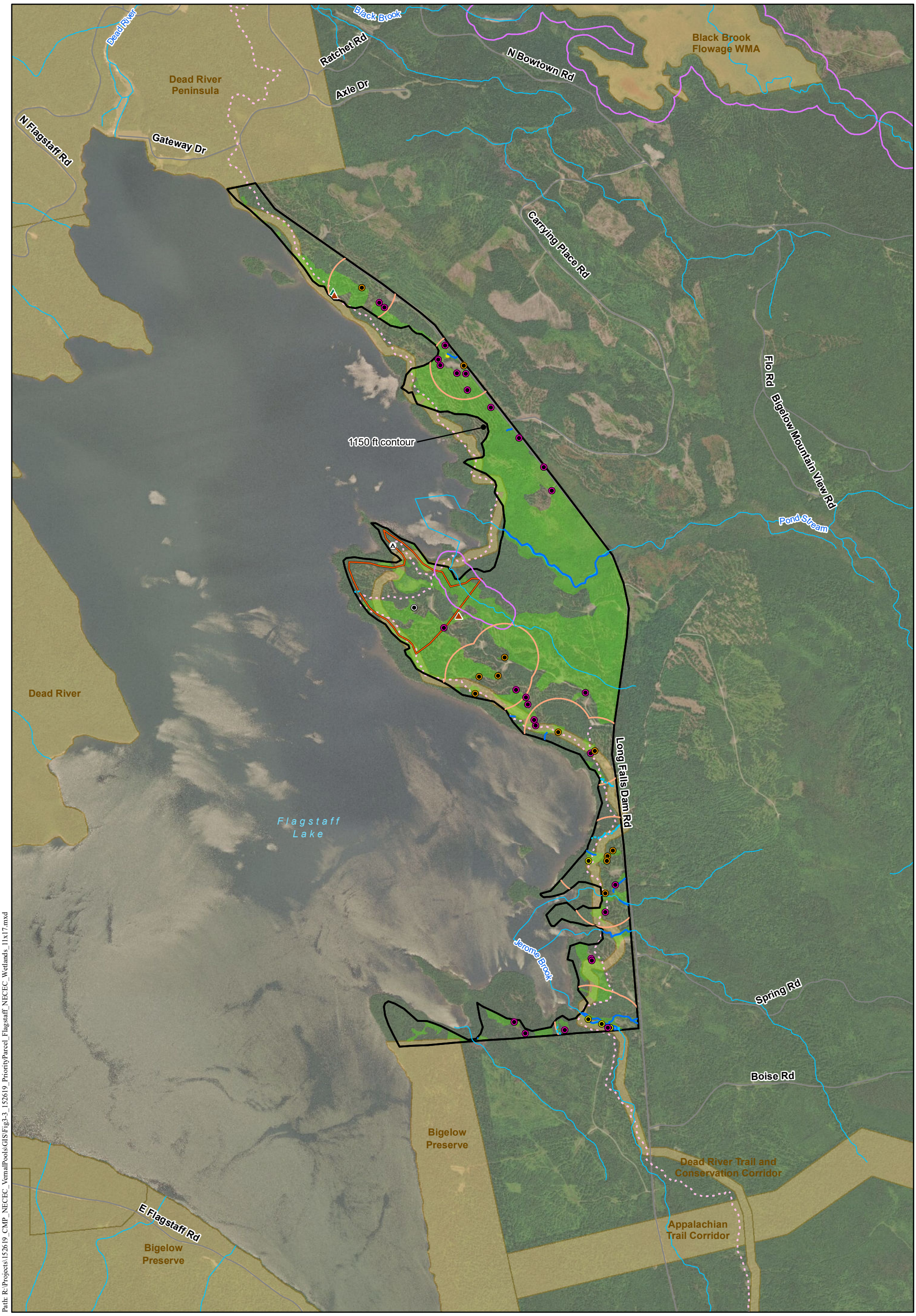

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- Wetland Data Point
- Upland Data Point
- Corps Vernal Pool
- Vernal Pool
- Potential Vernal Pool
- Amphibian Breeding Area
- Stream (NHD)
- Maine Huts & Trails Hut
- Maine Huts & Trails Main Trail
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Road
- Delineated Wetland/ Wetland Island
- Vernal Pool
- Critical Terrestrial Habitat (750')
- Inland Waterfowl and Wading Bird Habitat
- Conservation Land
- Survey Area
- Approximate Maine Huts and Trails Lease

1 " = 2,000 '

0 1,000 2,000

Feet

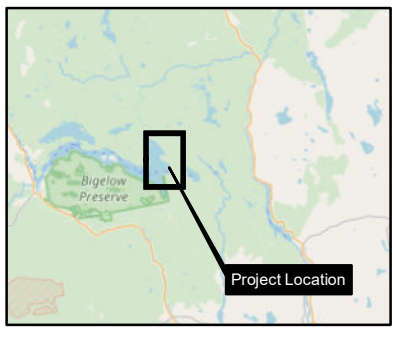

Figure 3.3: Natural Resources Flagstaff Lake Tract

Somerset County Maine

NAD 1983 HARN StatePlane Maine West FIPS 1802 Feet Foot US
Transverse Mercator
North American 1983 HARN

Date: 8/6/2018
Author: KK
PEI: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

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APPENDIX 3A IPAC RESULTS: FLAGSTAFF TRACT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

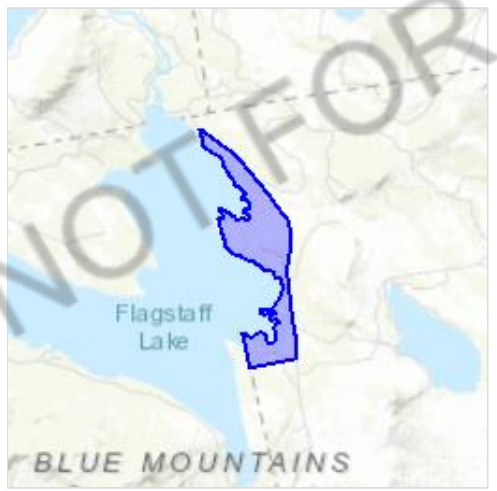
Project information

NAME

Compensatory Mitigation

LOCATION

Somerset County, Maine



DESCRIPTION

FLT

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 04431

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

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NOT FOR CONSULTATION

Canada Lynx Lynx canadensis — Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/3652

Northern Long-eared Bat Myotis septentrionalis — Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the

NOT FOR CONSULTATION

Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cape May Warbler Setophaga tigrina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Jul 31
Evening Grosbeak Coccothraustes vespertinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Olive-sided Flycatcher Contopus cooperi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31

NOT FOR CONSULTATION

Rusty Blackbird *Euphagus carolinus* — Breeds May 10 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

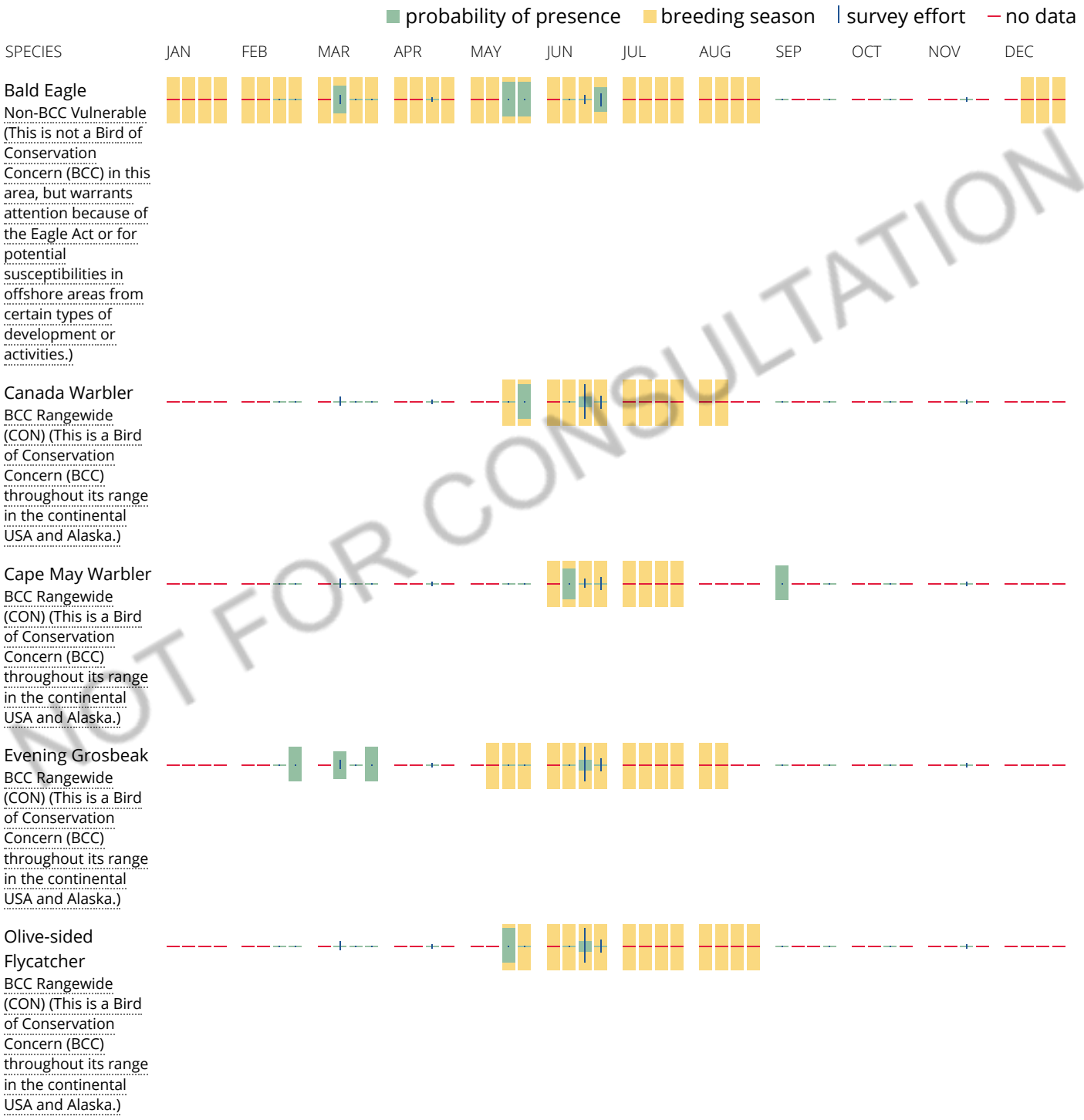
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

NOT FOR CONSULTATION

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

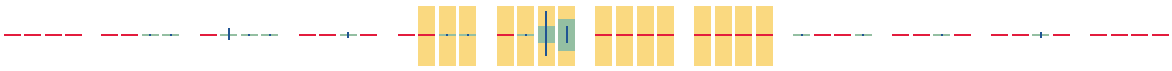
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



NOT FOR CONSULTATION

Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds

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guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize

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potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1Fh
- PEM1Eh
- PEM1Eb
- PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

- PFO4E
- PSS1E
- PSS1Eh

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PFO5Fb
PSS1Eb
PSS4E
PSS1F

FRESHWATER POND

PUBFb

LAKE

L1UBHh

RIVERINE

R3UBH
R4SBC
R5UBH
R2UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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APPENDIX 3B VEGETATION LIST: FLAGSTAFF TRACT

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Abies balsamea	Balsam Fir	Pinaceae	FAC
Acataea pachypoda	White Baneberry	Ranunculaceae	FACU
Acer pennsylvanicum	Striped Maple	Sapindaceae	FACU
Acer rubrum	Red Maple	Sapindaceae	FAC
Acer saccharum	Sugar Maple	Sapindaceae	FACU
Alnus incana ssp. *rugosa*	Speckled Alder	Betulaceae	FACW
Anemone quinquefolia	Nightcaps	Ranunculaceae	FACU
Aralia nudicaulis	Wild Sarsaparilla	Araliaceae	FACU
Betula alleghaniensis	Yellow Birch	Betulaceae	FAC
Betula papyifera	White Birch	Betulaceae	FACU
Betula populifolia	Gray Birch	Betulaceae	FAC
Calamagrostis canadensis	Bluejoint	Poaceae	OBL
Carex arctata	Drooping Wood Sedge	Cyperaceae	N/A
Carex brunnescens	Brownish Sedge	Cyperaceae	FACW
Carex crinita	Fringed Sedge	Cyperaceae	OBL
Carex debilis	White Edge Sedge	Cyperaceae	FACW
Carex echinata	Star Sedge	Cyperaceae	OBL
Carex gracillima	Graceful Sedge	Cyperaceae	FACU
Carex gynandra	Nodding Sedge	Cyperaceae	OBL
Carex intumescens	Greater Bladder Sedge	Cyperaceae	FACW
Carex stipata	Stalk-Grain Sedge	Cyperaceae	OBL
Carex stricta	Tussock Sedge	Cyperaceae	OBL
Carex trisperma	Three-Seed Sedge	Cyperaceae	OBL
Chamaedaphne calyculata	Leatherleaf	Ericaceae	OBL
Chamaepericlymenum canadense	Bunchberry	Cornaceae	FAC
Clematis virginiana	Virginia Virgin's-Bower	Ranunculaceae	FAC
Clintonia borealis	Yellow Bluebead Lily	Liliaceae	FAC
Coptis trifolia	Three-Leaf Goldthread	Ranunculaceae	FACW
Cypripedium acaule	Pink Lady's Slipper	Orchidaceae	FACW
Dendrolycopodium dendroideum	Prickley Tree Club Moss	Lycopodiaceae	FACU
Dichanthelium sp.	Rosette Grass	Poaceae	N/A
Dryopteris sp.	Wood Fern	Dryopteridaceae	N/A
Eleocharis acicularis	Needle Spike Rush	Cyperaceae	OBL
Eleocharis palustris	Common Spike Rush	Cyperaceae	OBL
Epigaea repens var. *glabrifolia*	Trailing Arbutus	Ericaceae	N/A

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Equisetum arvense	Field Horsetail	Equisetaceae	FAC
Equisetum sylvaticum	Woodland Horsetail	Equisetaceae	FACW
Fagus grandifolia	American Beech	Fagaceae	FACU
Galium asprellum	Rough Bedstraw	Rubiaceae	OBL
Gaultheria hispidula	Creeping Snowberry	Ericaceae	FACW
Gaultheria procumbens	Eastern Teaberry	Ericaceae	FACU
Gymnocarpium dryopteris	Northern Oak Fern	Woodsiaceae	FACU
Ilex mucronata	Mountain Holly	Aquifoliaceae	OBL
Ilex verticillata	Winterberry	Aquifoliaceae	FACW
Impatiens capensis	Jewelweed	Balsaminaceae	FACW
Iris versicolor	Harlequin Blueflag	Iridaceae	OBL
Juncus effusus	Soft Rush	Juncaceae	OBL
Kalmia angustifolia	Sheep Laurel	Ericaceae	FAC
Larix laricina	American Larch	Pinaceae	FACW
Linnaea borealis	Twinflower	Caprifoliaceae	FAC
Lonicera canadensis	American Honeysuckle	Caprifoliaceae	FACU
Lysimachia borealis	Starflower	Myrsinaceae	FAC
Maianthemum canadense	Canada Mayflower	Ruscaceae	FACU
Medeola virginiana	Indian Cucumber Root	Liliaceae	FACU
Myrica gale	Sweetgale	Myricaceae	OBL
Onoclea sensibilis	Sensitive Fern	Onocleaceae	FACW
Osmunda claytonia	Interrupted Fern	Osmundaceae	FAC
Osmundastrum cinnamomeum	Cinnamon Fern	Osmundaceae	FACW
Oxalis montana	Northern Wood Sorrel	Oxalidaceae	FACU
Parathelypteris novaborecensis	New York Fern	Thelypteridaceae	FAC
Picea rubens	Red Spruce	Pinaceae	FACU
Pinus strobus	Eastern White Pine	Pinaceae	FACU
Populus balsamifera	Balsam Poplar	Salicaceae	FACW
Populus grandidentata	Big-Tooth Aspen	Salicaceae	FACU
Populus tremuloides	Quaking Aspen	Salicaceae	FACU
Pteridium aquilinum	Bracken Fern	Dennstaeditaceae	FACU
Rhododendron canadense	Rhodora	Ericaceae	FACW
Rhododendron groenlandica	Rusty Labrador Tea	Ericaceae	OBL
Ribes glandulosum	Skunk Currant	Grossulariaceae	FACW
Ribes lacustre	Bristly Black Gooseberry	Grossulariaceae	FACW
Rubus hispidus	Bristly Dewberry	Rosaceae	FACW
Rubus idaeus	Red Raspberry	Rosaceae	FACU
Salix spp.	Willow	Salicaceae	N/A
Scirpus cyperinus	Common Woolsedge	Cyperaceae	OBL

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Scirpus microcarpus	Barber Pole Bulrush	Cyperaceae	OBL
Solidago rugosa	Wrinkle Leaf Goldenrod	Asteraceae	FAC
Sorbus americana	American Mountain Ash	Rosaceae	FAC
Spiraea alba var. *latifolia*	Meadowsweet	Rosaceae	FACW
Spiraea tomentosa	Steeplebush	Rosaceae	FACW
Thalictrum pubescens	Tall Meadow Rue	Ranunculaceae	FACW
Thuja occidentalis	Northern White Cedar	Cupressaceae	FACW
Trillium erectum	Stinking Benjamin	Melanthiaceae	FACU
Trillium undulatum	Painted Trillium	Melanthiaceae	FACU
Typha latifolia	Broad Leaved Cattail	Typhaceae	OBL
Vaccinium angustifolium	Lowbush Blueberry	Ericaceae	FACU
Vaccinium corymbosum	Highbush Blueberry	Ericaceae	FACW
Veratrum viride	American False Hellebore	Melanthiaceae	FACW
Viburnum dentatum	Smooth Arrowwood	Adoxaceae	FAC
Viburnum lantanoides	Hobblebush	Adoxaceae	FACU
Viburnum lentago	Nanny-berry	Adoxaceae	FAC
Viola spp.	Violet	Violaceae	N/A
INDICATOR STATUS	OCCURRENCE IN WETLANDS (% per Reed, 1998)		
Obligate (OBL)	Almost always occurs in wetlands under natural conditions (99%)		
Facultative Wetland (FACW)	Usually in wetlands, occasionally found in non-wetlands (67- 99%)		
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands. (33-67%)		
Facultative Upland (FACU)	Usually in non-wetlands, occasionally found in wetlands (1-33%)		
Upland (UPL)	Almost always in non-wetlands under natural conditions (1%)		

[1] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17.USACE National Wetland Plant List. Web 20 June 2018.

[2] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TN-12-1, USACE Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at https://www.fws.gov/wetlands/documents/national-wetland-plant-list-indicator-rating-definitions.pdf [Verified 20 June 2018].

*Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands.* Washington, DC, USFWS.

4.0 POOLER PONDS TRACT

4.1 Site Location Information

Municipality: The Forks Plantation **County:** Somerset

Biophysical Region: Central Mountains

Watershed (HUC 12): Kelly Brook-Kennebec River (010300030101)

NECEC Components within HUC 8 (01030003) Watershed: HVDC, Existing right of way

Closest NECEC Component: HVDC, Existing ROW

Coordinates of Site Centroid (Lat/Long WGS 84): 45°17'25.16"N, 69°59'28.86"W

4.2 Natural Resource Inventory Summary (quantities are +/-):

Total Site Area .....81.24 acres

NWI Palustrine Wetland Area .....16.20 acres

Delineated and GPS-surveyed Palustrine Wetland Area.....18.33 acres

NHD Rivers and Streams .....6,390 feet (1.21 miles)

(NOTE: NHD Rivers and Streams length above includes length of flowage path through Pooler Ponds)

Delineated and GPS-surveyed Rivers and Streams ….....4,480 feet (0.85 mile)

Upland Area.....62.91 acres

Inland Wading Bird and Waterfowl Habitat (Moderate Value) ……...31.39 acres

Significant Vernal Pools .....None

Other Non-Significant Vernal Pool Types ……1 medium value VP

Vernal Pool Critical Terrestrial Habitat (750 feet) ..... 8.10 acres

4.3 Site Description

Approximately three miles south of the village of The Forks is the 81.24-acre Pooler Ponds Tract (hereafter “PPT” or the “Tract”), bound on the west by 0.8 mile of the Kennebec River, on the east by Maine Scenic Byway US Route 201 (also known as the Old Canada Road), and on the north by a rafting and river campground (Figure 1, Photos 4.1 and 4.2). The Tract is located 3.4 miles north of the Appalachian Trail crossing of US Route 201 and is traversed by the Kennebec River Trail (Photo 4.3). Aside from boating and fishing access roads as well as hiking trails, PPT is otherwise undeveloped (Photo 4.4), and the centerpiece of the Tract is a moderate value 31.39-acre IWWH.

4.4 Surrounding Land Use, Protected Open Space and Focus Areas

PPT is displayed on Figure 4.2, MLUPC's Land Use Guidance Map for The Forks Plantation (T1 R4 BKP EKR). Most of PPT is designated as a General Management Subdistrict M-GN). In addition, the following Protection Subdistricts occur at PPT:

- P-GP – Great Pond
- P-SL1 – areas within 250 feet of the normal high-water mark
- P-SL2 – areas within 75 feet of the normal high-water mark
- P-WL1 – wetlands of special significance (WOSS)
- P-WL2 – scrub shrub and other nonforested wetlands
- P-WL3 – forested wetlands (excluding those covered under PWL-1, PWL-2)

Pooler Ponds (MIDAS # 4106) are also designated as a "water quality limiting lake" (WQLL) sensitive to increased phosphorus concentrations and therefore is subject to additional residential development restrictions. There are no Conserved Lands or Focus Areas immediately adjacent to or within one mile of PPT.

4.5 Wildlife Use

Wildlife usage and habitat evaluations on PPT were conducted based on field surveys, aerial photo interpretation of landscape and terrain, and research of IPaC results from the USFWS for endangered species, critical habitat, migratory birds, and fisheries in and around the area. According to the results of the IPaC report (Appendix 4A), two threatened species: Canada lynx (*Lynx canadensis*) and Northern long-eared bat (*Myotis septentrionalis*); and one endangered species – Atlantic salmon (*Salmo salar*) could be affected by activities on the property.

Multiple moose (*Alces alces*) and whitetail deer (*Odocoileus virginianus*) remains along with active beaver (*Castor canadensis*) dams were observed on the property during natural resource surveys. As moderate rated IWWH, the abundance of aquatic vegetation, chiefly pond lilies (*Nymphaea* spp., *Nuphar* spp.) and other aquatics including watershield (*Brasenia schreberi*), arrowhead (*Sagitarria cuneata*), and floating manna grass (*Glyceria septentrionalis)* are worthy food sources for waterfowl and moose as well as cover habitat for amphibians. The large areas of adjoining mixed forested upland also provide browse for both deer and moose.

Pooler Ponds, and the adjoining emergent and forested wetlands, forested uplands and Kennebec River provide ideal habitat for several bird species. The IPaC report indicates two BCC – Canada warbler (*Cardellina canadensis*) and Cape May warbler (*Setophaga tigrina*) – could be affected by activities on the property. Other birds that may use PPT include, but are not limited to bald eagle (*Haliaeetus leucocephalus*), belted kingfisher (*Megacerylt alcyon*), several species of warblers (*Parulidae*), common loon (*Gavia immer*), northern goshawk (*Accipiter gentilis*), yellow-bellied flycatcher (*Empidonax flaviventris*), olive-sided flycatcher (*Contopus cooperi*), red-breasted nuthatch (*Sitta canadensis*), winter wren (*Troglodytes hiemalis*), and rusty blackbird (*Euphagus carolinus*).

A gray tree frog (*Hyla versicolor*) was observed on the Tract near a small stream bed (Photo 4.5). Spotted salamander (*Ambystoma maculatum*) egg masses (Photo 4.6) were observed on the edges of the pond complex and in the one delineated medium-value vernal pool found during field surveys. American toads (*Anaxyrus americanus*) and green frogs (*Lithobates clamitans*) are other common amphibians within the Tract. Garter snakes (*Thamnophis spp*.) were also observed on the Tract and turtles that may exist on site include, but may not be limited to painted turtles (*Chrysemys picta*), and common snapping turtle (*Chelydra serpentine*).

4.6 Vegetation

The Tract includes a variety of vegetative communities which provide different cover types and habitat characteristics. The property is primarily composed of mature forest, portions of which include deciduous forest and mixed coniferous-deciduous forest. There are also large areas of scrub-shrub and emergent habitats. The scrub-shrub areas are located along the Kennebec River, near the northwest boundary of the property, and typically in between the emergent areas along the shoreline and the upland forest further up slope from the ponds. The emergent areas are primarily located along the shoreline of Pooler Ponds.

Dominant tree species in the upland deciduous forest include northern red oak (*Quercus rubra*) and American beech (*Fagus grandifolia*). Dominant tree species in the upland mixed coniferous-deciduous forest are balsam fir (*Abies balsamea*), eastern white pine (*Pinus strobus*), red maple (*Acer rubrum*), and eastern hemlock (*Tsuga canadensis*). The scrub-shrub stratum contains beaked hazelnut (*Corylus cornuta*), choke cherry (*Prunus virginiana*), and striped maple (*Acer pennsylvanicum).* The herbaceous understory is dominated by Canada mayflower (*Maianthemum canadense*), starflower (*Lysimachia borealis*), bracken fern (*Pteridium aquilinum*), and wood fern (*Dryopteris* sp.).

Forested wetlands are dominated by red maple and yellow birch (*Betula alleghaniensis*). The typical scrub-shrub stratum contains saplings of red maple and black ash (*Fraxinus nigra*), as well as the occasional occurrence of speckled alder (*Alnus incana* ssp. *rugosa*). The herbaceous layer in the forested wetlands is dominated by sensitive fern (*Onoclea sensibilis*), bluejoint grass (*Calamagrostis canadensis*), and common wool sedge (*Scirpus cyperinus*).

Emergent areas (Photo 4.7) are predominantly confined to the pond margins and are dominated by graminoids, most specifically floating manna grass (*Glyceria septentrionalis*), fowl manna grass (*Glyceria striata*), three-way sedge (*Dulichium arundinaceum*), common spike-rush (*Eleocharis palustris*) and common wool sedge (*Scirpus cyperinus*). Other sedges found around the pond margin include fringed sedge (*Carex crinita*), northeastern sedge (*Carex cryptolepis*), hop sedge (*Carex lupulina*), sallow sedge (*Carex lurida*), and lesser bladder sedge (*Carex vesicaria*). Common forbs found in this zone are Allegheny monkey flower (*Mimulus ringens*) and swamp candles (*Lysimachia terrestris*). Adjacent scrub-shrub wetlands (Photo 4.8) are dominated by speckled alder, meadowsweet (*Spiraea alba* var. *latifolia*), and common winterberry (*Ilex verticillata*).

Submerged aquatic vegetation includes white water-lily (*Nymphaea odorata*), yellow pond-lily (*Nuphar* sp.), bur-reed (*Sparganium* sp.), northern arrowhead (*Sagittaria cuneata*), water-shield (*Brasenia schreberi*), and pondweed (*Potamogeton* sp).

4.7 Wetland Characteristics, Functions and Values

Combining the approximately 8.12-acre Pooler Ponds complex (PUB) with approximately 10.21 acres of additional palustrine wetland, 18.33 acres (22.6%) of the 81.24 total acres on PPT were identified as

palustrine wetland during the field survey (Figure 4.3). The primary wetland system on this Tract is palustrine unconsolidated bottom (PUB) associated with the open water of the pond complex. The fringe of this wetland system is enveloped by a graminoid-dominant palustrine emergent area (PEM) (Photo 4.8), which is bordered by a co-dominant palustrine scrub-shrub wetland (PSS). The codominance of these two wetland types creates outstanding wildlife habitat for inland wading birds and waterfowl (IWWH). The transitional habitat between open water, emergent marsh, scrub-shrub, forested wetland, and upland forest provides a high degree of vertical stratigraphy in vegetation that further enhances wildlife attractiveness for numerous species of amphibians, reptiles, birds, and mammals. At the southern end of the pond complex, an intermittent stream flows southwest to the Kennebec River. The Tract has approximately 0.8 river-miles of frontage along the Kennebec River, a permanently flooded, lower perennial riverine wetland system with an unconsolidated bottom (R2UBH). Where the land does not abruptly drop from bedrock cliff to river, there is generally a 20- to 50-foot strip of palustrine scrub shrub (PSS) wetland along the fringe of the Kennebec River (as described earlier in Section 1.5 of this document).

As mapped by the USDA NRCS on Web Soil Survey, approximately 56 acres (68%) of PPT is underlain by somewhat excessively drained (SED) soils. In addition to slightly more than eight acres of waterbody, the remainder of the Tract is mapped as well drained. The soils are derived from glacial outwash plains, till plains and eskers consisting of fine silt loams and clay loams. Hydric soils were identified primarily along fringe wetlands which occur around most of Pooler Ponds and parts of the Kennebec River. The fringe wetlands associated with the pond are classified as PEM and PSS with some smaller components of PFO. A small PSS wetland was mapped along the Kennebec River consisting of fine loamy sands.

TABLE 4-1 SUMMARY OF FUNCTIONS AND VALUES OF WETLANDS ON THE 81.24-ACRE POOLER POND TRACT

FUNCTION/VALUE	EXPLANATION
Groundwater Recharge/Discharge (GW)	PPT occurs on the Kennebec River Significant Sand and Gravel Aquifer and wetlands on the Tract are therefore sites of groundwater discharge from up gradient, as well as recharge areas to the adjoining Kennebec River (Neil and Locke 2008).
Flood flow Alteration (FF)	The Forks Twp is designated as "no data/No Specific Flood Hazard Area" (Dudley and Schalk 2006), however water levels along the Kennebec River are actively managed at the Long Falls Dam outlet of Flagstaff Lake and the Harris Station Dam on Indian Pond by Brookfield Renewable Energy. In relation to these fluctuating water levels, a principal function of wetlands on the Pooler Ponds parcel that are along and hydrologically connected to the Kennebec River is Floodflow Alteration.
Fish and Shellfish Habitat (FH)	The Kennebec River is popular for brook trout and landlocked salmon fishing and on the first day of field surveys an angler was removing his inflatable boat at the "Hole in the Wall" access point (Photo 4.3) at PPT after a successful morning of fishing. Pooler Ponds lack a perennial stream connection to the River and are most likely habitat for a warm water fishery.
Production Export (PE)	As evidenced by browse, droppings and other sign, woody vegetation in wetlands is a fundamental food source for all herbivorous and omnivorous wildlife inhabiting PPT. Seeds, roots and stems from herbaceous vegetation in not PUB, PEM, PSS and PFO wetlands that make up the IWWH on PPT are also food sources for not only waterfowl, but the wide variety of mammals, birds, amphibians, reptiles, fish and insects that inhabit or traverse the Tract.
Sediment/Toxicant/ Pathogen Retention (STPR)	Micro-topography as well as woody and herbaceous vegetation throughout wetlands around the perimeter off Pooler Ponds physically slow surface water transport and retain these degraders of water quality to the Kennebec River. Sediments/toxicants/pathogens trapped with accumulation of vegetative remains as peat or other forms of hydric soils is another way PPT wetlands protect water quality of Pooler Ponds and the Kennebec River.
Nutrient Removal (NR)	Micro-topography as well as woody and herbaceous vegetation throughout PPT wetlands slow/detain surface water transport of phosphorus adhering to sediment, protecting Pooler Ponds (designated as WQLL, from eutrophication and general water degradation of Kennebec River. Direct uptake of nutrients by wetland vegetation and accumulation of plant remains in organic soils and peat is another way PPT wetlands protect water quality.
Sediment/Shoreline Stabilization (SS)	Riverine vegetated wetlands aligned along the east shore of the Kennebec River buffer and protect the adjoining upland shoreline from scour and erosion. Palustrine wetlands around the perimeter of Pooler Ponds also stabilize adjoining upland and thereby limiting and protecting lake degradation.
Wildlife Habitat (WH)	In addition to direct observation as well as tracks, droppings and other sign, moose, deer, beaver, otter, mink and other smaller mammals are abundant on PPT that is further enhanced by the presence of the moderate value IWWH (ID UMO-9951) near the center of the Tract. As described in greater detail above, PPT provides high quality habitat for a wide variety of large mammals and furbearers, raptors, waterfowl, passerines songbirds, amphibians, reptiles and insects.
Educational/ Scientific Value (ED)	This easily accessible Tract provides diversity and abundance of aquatic plants and graminoids relevant to the study of botany and wetland ecology. In addition, the Tract provides a comprehensive zonation of vegetative stratigraphy / wetland types corresponding to the topographic gradient.
Recreation (REC)	PPT is located between a commercial rafting and river guide operation and campground immediately to the north and the Appalachian Trail Corridor 3.4 miles to the south. The Tract is also crossed by the Kennebec River Trial and is an access point to fishing and boating on the Kennebec River.

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4.8 Compensation

As part of the compensation package for NECEC, the approximately 81.24-acre Pooler Ponds Tract (Figure 4.3) will be permanently protected by a conservation easement or similar instrument. Preservation of this Tract along approximately 0.8 mile of the Kennebec River will secure access for rafting, other boating/canoeing and fishing. In addition, approximately 40 percent (31.39 acres) of the 81.24-acre FLT is a moderate value IWWH comprised of diverse wetland types (PFO, PSS, PEM, PUB). Preservation of PPT will result in permanent protection from development and will preserve the existing recreational opportunities, wildlife habitat, water quality benefits, vernal pool habitat, and educational opportunities adjacent to a Maine Scenic Byway (US Route 201).

4.9 Photographs

PHOTO 4-1 A NORTHWARD VIEW OF POOLER PONDS DISPLAYS THE HYDROLOGIC CONNECTIVITY OF THIS GREAT POND, WETLAND OF SPECIAL SIGNIFICANCE (WOSS). NOTE: ROUTE 201 IN THE BACKGROUND

PHOTO 4-2 THE KENNEBEC RIVER SERVES AS THE WESTERN BOUNDARY OF THE TRACT AND PROVIDES RECREATIONAL OPPORTUNITIES SUCH AS FISHING AND RAFTING

PHOTO 4-3 THE KENNEBEC RIVER TRAIL TRAVERSES PPT AND PROVIDES RIVER ACCESS FOR ANGLERS AND BOATERS; LOCALLY THIS ACCESS POINT IS REFERRED TO AS 'HOLE IN THE WALL'

PHOTO 4-4 POOLER PONDS HOSTS A VARIETY OF ECOLOGICAL SYSTEMS, INCLUDING PALUSTRINE UNCONSOLIDATED BOTTOM (PUB), EMERGENT (PEM), SCRUB-SHRUB (PSS), AND FORESTED (PFO) WETLANDS

PHOTO 4-5 A GRAY TREE FROG (*HYLA VERSICOLOR*) RESTS ON A SENSITIVE FERN (*ONOCLEA SENSIBILIS*) FROND

PHOTO 4-6 EIGHT SPOTTED SALAMANDER EGG MASSES FOUND NOT ONLY IN THIS SINGLE VERNAL POOL ON PPT, BUT WERE ALSO OBSERVED AT SEVERAL LOCATIONS IN POOLER PONDS AS WELL

PHOTO 4-7 EMERGENT WETLANDS (PEM) DOMINATED BY A SUITE OF SEDGES (*CAREX* SPP.) AND COMMON WOOL SEDGE (*SCIRPUS CYPERINUS*) ARE PREVALENT ALONG THE POND EDGE

PHOTO 4-8 SCRUB-SHRUB WETLANDS (PSS) ARE TYPICALLY DOMINATED BY SPECKLED ALDER (*ALNUS INCANA* SSP. *RUGOSA*) WITH SENSITIVE FERN (*ONOCLEA SENSIBILIS*) AS THE DOMINANT UNDERSTORY

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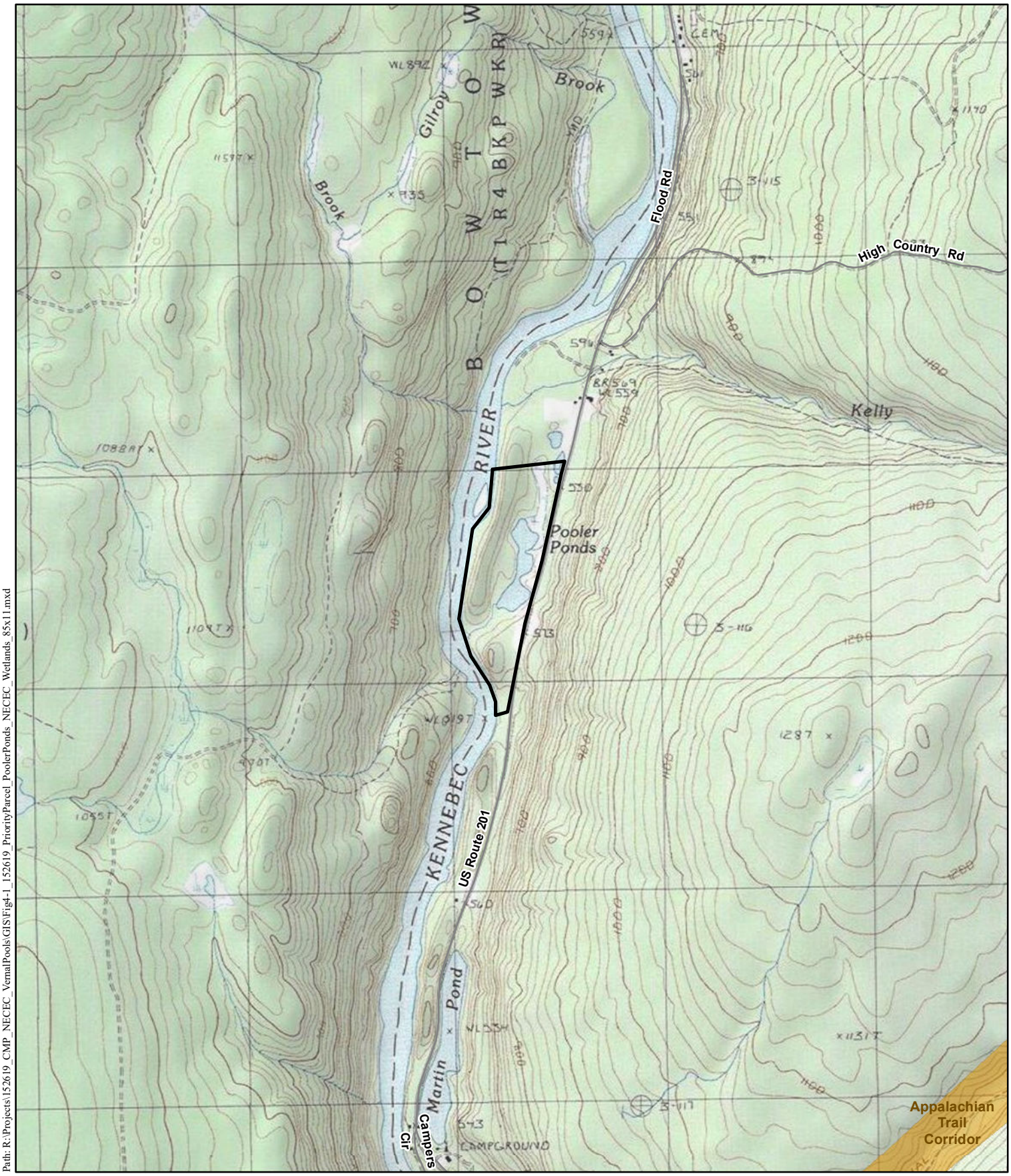

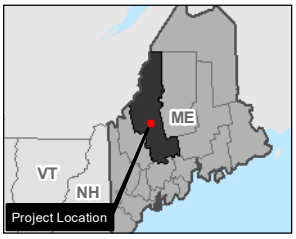

Road
Conserved Lands
Survey Boundary

N
W E
S

SCALE: 1 " = 2,000 '

0 1,000 2,000
Feet

Figure 4.1: Locus
Pooler Ponds Tract

Somerset County
Maine

Date:8/6/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

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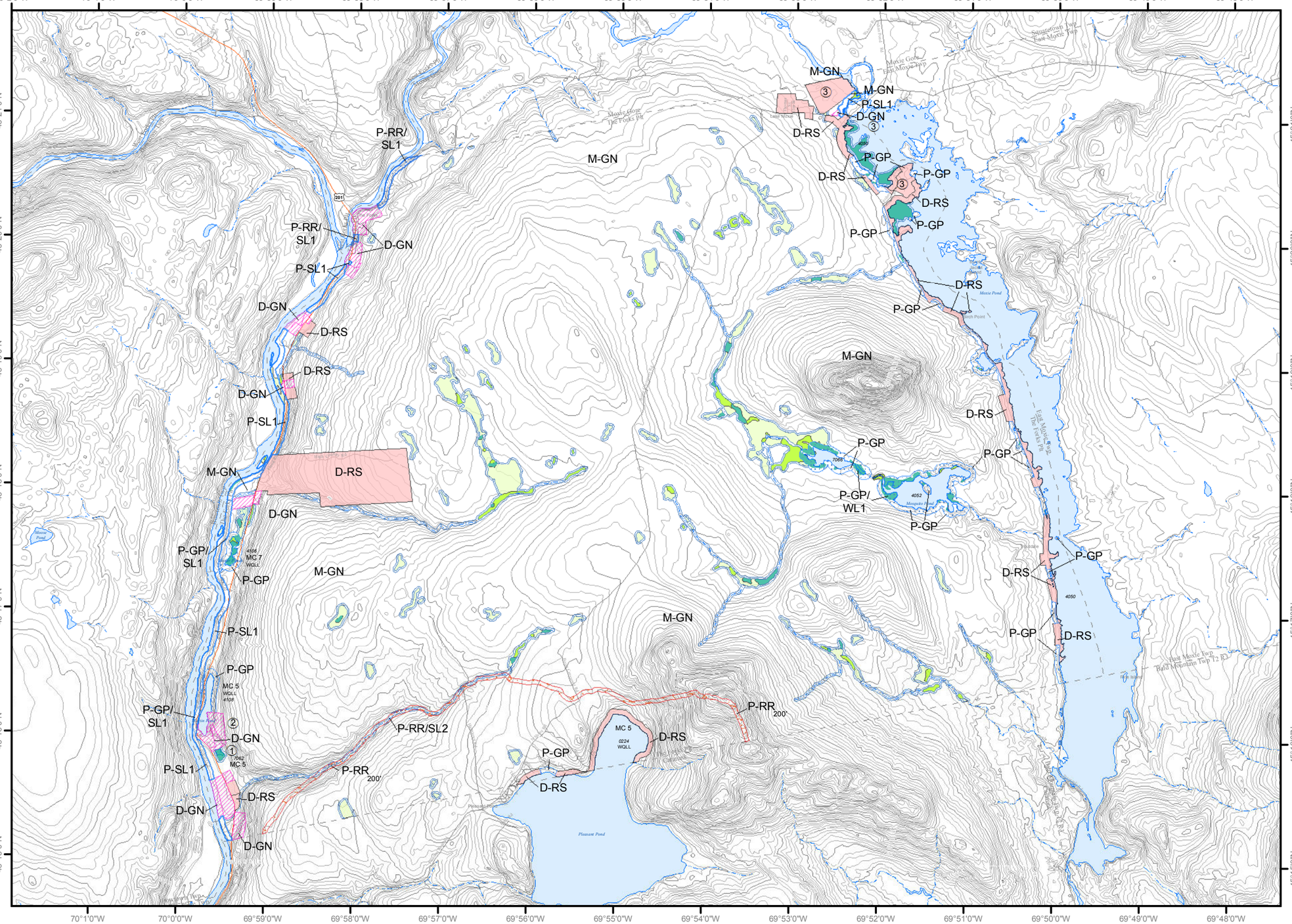
The Forks Plt.

T1 R4 BKP EKR

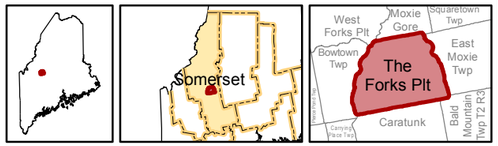
Somerset County



Land Use Guidance Map

Department of Agriculture, Conservation and Forestry

Maine Land Use Planning Commission



Legend

DEVELOPMENT SUBDISTRICTS

- D-GN: General
- D-RS: Residential

PROTECTION SUBDISTRICTS

- P-GP: Great Pond
- P-RR200: Recreation - 200'
- P-RR: Recreation
- P-SL1: Shoreland - 250'
- P-SL2: Shoreland - 75'
- P-WL1: Wetlands of Special Significance
- P-WL2: Scrub-shrub Wetlands
- P-WL3: Forested Wetlands

This map does not show all designated P-WL Subdistricts, such as non-tidal water bodies and freshwater wetlands within 25 feet of flowing waters.

This map is a reducedsize version and should not be considered definitive. Full sized, official Land Use Guidance Maps are available on the LUPC website or by request.

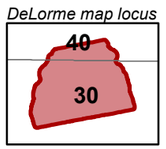
Amendments

Location #	Zoning Permit	Effective Date	Remarks
1	ZP633	03/11/1999	
2	ZP633A	05/12/2000	
		08/18/2005	Adoption of digital NWI wetlands
3	ZP708	07/26/2007	

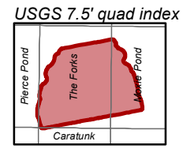
0 1,400 2,800 4,200 5,600 Meters

0 4,800 9,600 14,400 19,200 Feet

DeLorme map locus



USGS 7.5' quad index



(1) Map amendment location

▲ Point at which a river drains 25 square miles - symbol points upstream (12 M.R.S. Sec. 682-B(4))

9999 MIDAS number: Unique number assigned to each standing body of water in Maine.

WQLL Water Quality Limiting Lake - Refer to Section 10.23,E,3,g of the Commission's Land Use Districts and Standards.

MC# Lake Management Classes - Refer to Section 10.02 (Definitions) of the Commission's Land Use Districts and Standards.

SOURCES: Maine Land Use Planning Commission, USGS

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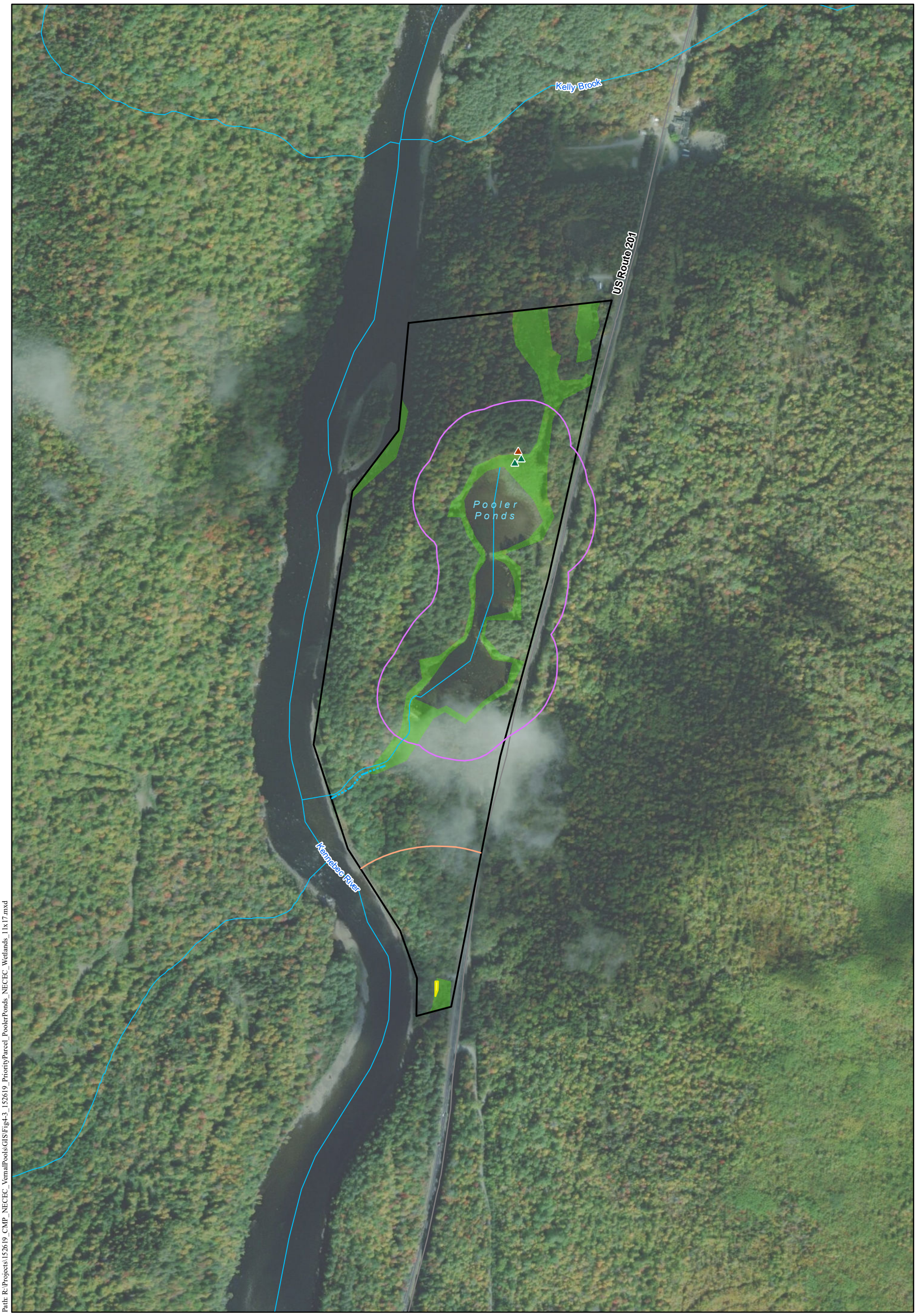

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- Wetland Data Point
- Upland Data Point
- Stream (NHD)
- Delineated Intermittent Stream
- Road
- Delineated Wetland
- Vernal Pool
- Critical Terrestrial Habitat (750')
- Inland Waterfowl and Wading Bird Habitat
- Survey Area

1 " = 500 '

0 250 500

Feet

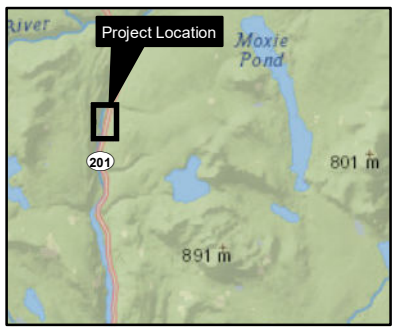

Figure 4.3: Natural Resources
Pooler Ponds Tract

Somerset County
Maine

NAD 1983 HARN StatePlane Maine West FIPS 1802 Feet
Foot US
Transverse Mercator
North American 1983 HARN

Date: 8/6/2018
Author: KK
PEI: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

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APPENDIX 4A IPAC RESULTS: POOLER PONDS TRACT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Project information

NAME

Compensatory Mitigation

LOCATION

Somerset County, Maine

DESCRIPTION

Pooler Ponds Tract

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 04431

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

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NOT FOR CONSULTATION

Canada Lynx Lynx canadensis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon Salmo salar There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NOT FOR CONSULTATION

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cape May Warbler *Setophaga tigrina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

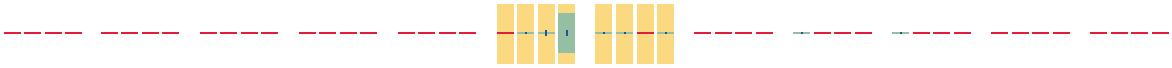
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

NOT FOR CONSULTATION

probability of presence | breeding season | survey effort | no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Canada Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)												

Cape May Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

NOT FOR CONSULTATION

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

NOT FOR CONSULTATION

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1Cx
- PFO4/SS1E
- PSS1E

FRESHWATER POND

- PUBH
- PUBFx

RIVERINE

- R2UBH
- R4SBC
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

NOT FOR CONSULTATION

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

APPENDIX 4B VEGETATION LIST: POOLER PONDS TRACT

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1,2]
Abies balsamea	Balsam Fir	Pinaceae	FAC
Acer pennsylvanicum	Striped Maple	Sapindaceae	FACU
Acer rubrum	Red Maple	Sapindaceae	FAC
Agrostis capillaris	Colonial Bentgrass	Poaceae	FAC
Agrosits gigantea	Redtop Bentgrass	Poaceae	FACW
Alnus incana ssp. *rugosa*	Speckled Alder	Betulaceae	FACW
Anthoxanthum odoratum	Sweet Vernal Grass	Poaceae	FACU
Apocynum cannabinum	Indian Hemp	Apocynaceae	FAC
Betula alleghaniensis	Yellow Birch	Betulaceae	FAC
Betula populifolia	Gray Birch	Betulaceae	FAC
Brasenia schreberi	Water-Shield	Nymphaceae	OBL
Calamagrostis canadensis	Bluejoint	Poaceae	OBL
Cardamine diphylla	Crinkleroot	Brassicaceae	FACU
Carex crinita	Fringed Sedge	Cyperaceae	OBL
Carex cryptolepis	Northeastern Sedge	Cyperaceae	OBL
Carex intumescens	Greater Bladder Sedge	Cyperaceae	FACW
Carex lupulina	Hop Sedge	Cyperaceae	OBL
Carex lurida	Shallow Sedge	Cyperaceae	OBL
Carex scoparia	Pointed Broom Sedge	Cyperaceae	FACW
Carex vesicaria	Lesser Bladder Sedge	Cyperaceae	OBL
Caulophyllum thalictroides	Blue Cohosh	Berberidaceae	N/A
Chamaepericlymenum canadense	Bunchberry	Cornaceae	FAC
Corylus cornuta	Beaked Hazelnut	Betulaceae	FACU
Crataegus spp.	Hawthorne	Rosaceae	N/A
Dryopteris intermedia	Evergreen Wood Fern	Dryopteridaceae	FAC
Dulichium arundinaceum	Three-Way Sedge	Cyperaceae	OBL
Eleochaeris palustris	Common Spike-Rush	Cyperaceae	OBL
Equisetum arvense	Field Horsetail	Equisetaceae	FAC
Equisetum sylvaticum	Woodland Horsetail	Equisetaceae	FACW
Fagus grandifolia	American Beech	Fagaceae	FACU
Fraxinus americana	White Ash	Oleaceae	FACU
Fraxinus nigra	Black Ash	Oleaceae	FACW
Fraxinus pennsylvanica	Green Ash	Oleaceae	FACW
Glyceria septentrionalis	Floating Manna Grass	Poaceae	OBL
Glyceria striata	Fowl Manna Grass	Poaceae	OBL
Hieracium aurantiacum	Orange Hawkweed	Asteraceae	N/A

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1,2]
Hypericum perforatum	Common St. John's Wort	Hypericaceae	FACW
Ilex verticillata	Common Winterberry	Aquifoliaceae	FACW
Impatiens capensis	Jewelweed	Balsaminaceae	FACW
Iris versicolor	Blue Iris	Iridaceae	OBL
Juncus articulatus	Joint-Leaved Rush	Juncaceae	OBL
Juncus effusus	Soft Rush	Juncaceae	OBL
Leucanthemum vulgare	Ox-Eye Daisy	Asteraceae	UPL
Lycopus sp.	Water Horehound	Lamiaceae	OBL
Lysimachia borealis	Starflower	Myrsinaceae	N/A
Lysimachia terrestris	Swamp Candles	Myrsinaceae	OBL
Maianthemum canadense	Canada Mayflower	Ruscaceae	FACU
Maianthemum racemosum	Feathery False Solomon's Seal	Ruscaceae	FACU
Matteuccia struthiopteris	Ostrich Fern	Onocleaceae	FAC
Mimulus ringens	Allegheny Monkey-Flower	Phrymaceae	OBL
Mitchella repens	Partridge Berry	Rubiaceae	FACU
Nuphar sp.	Pond-Lily	Nymphaceae	OBL
Nymphaea odorata	White Water-Lily	Nymphaceae	OBL
Onoclea sensibilis	Sensitive Fern	Onocleaceae	FACW
Parathelypteris novaborecensis	New York Fern	Thelypteridaceae	FAC
Parthenocissus quinquefolia	Virginia-Creeper	Vitaceae	FACU
Phalaris arundinacea	Reed Canary Grass	Poaceae	FACW
Pinus strobus	Eastern White Pine	Pinaceae	FACU
Poa pratensis ssp. *pratensis*	Kentucky Blue Grass	Poaceae	FACU
Populus grandidentata	Big-Tooth Aspen	Salicaceae	FACU
Potamogeton sp.	Pondweed	Potamogetonaceae	OBL
Prunus virginiana	Choke Cherry	Rosaceae	FACU
Pteridium aquilinum	Bracken Fern	Dennstaeditaceae	FACU
Pyrola elliptica	Elliptic-Leaved Shinleaf	Ericaceae	FACU
Quercus rubra	Northern Red Oak	Fagaceae	FACU
Rhus hirta	Staghorn Sumac	Anacardiaceae	N/A
Rubus hispidus	Bristly Dewberry	Rosaceae	FACW
Rubus idaeus	Red Raspberry	Rosaceae	FACU
Sagittaria cuneata	Northern Arrowhead	Alismataceae	OBL
Sambucus racemosa	Red Elderberry	Adoxaceae	FACW
Scirpus cyperinus	Common Woolsedge	Cyperaceae	OBL
Silene vulgaris	Bladder Campion	Caryophyllaceae	N/A
Solidago canadensis	Canada Goldenrod	Asteraceae	FACU
Solidago rugosa ssp. *rugosa*	Common Wrinkle Leaved Goldenrod	Asteraceae	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1,2]
Sparganium sp.	Bur-Reed	Typhaceae	OBL
Spiraea alba var. *latifolia*	Meadowsweet	Rosaceae	FACW
Swida sericea	Red Osier Dogwood	Cornaceae	FACW
Tsuga canadensis	Eastern Hemlock	Pinaceae	FACU
Ulmus americana	American Elm	Ulmaceae	FACW
Vaccinium angustifolium	Lowbush Blueberry	Ericaceae	FACU
Vaccinium angustifolium	Lowbush Blueberry	Ericaceae	FACU
Veratrum viride	American False Hellebore	Melanthiaceae	FACW
Veronica americana	American Speedwell	Plantaginaceae	OBL
Viburnum lantanoides	Hobblebush	Adoxaceae	FACU
Viola spp.	Violets	Violaceae	N/A
INDICATOR STATUS	OCCURRENCE IN WETLANDS (% per Reed, 1998)		
Obligate (OBL)	Almost always occurs in wetlands under natural conditions (99%)		
Facultative Wetland (FACW)	Usually in wetlands, occasionally found in non-wetlands (67- 99%)		
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands. (33-67%)		
Facultative Upland (FACU)	Usually in non-wetlands, occasionally found in wetlands (1-33%)		
Upland (UPL)	Almost always in non-wetlands under natural conditions (1%)		

[1] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17.USACE National Wetland Plant List. Web.20 June 2018.

[2] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TN-12-1, USACE Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at https://www.fws.gov/wetlands/documents/national-wetland-plant-list-indicator-rating-definitions.pdf [Verified 20 June 2018]

*Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands.* Washington, DC, USFWS.

5.0 GRAND FALLS TRACT

5.1 Site Location Information

Municipality: Spring Lake Township (T03 R04 BKP WKR) **County:** Somerset

Biophysical Region: Western Mountains

Watershed (HUC 12): Spring Lake-Upper Dead River (010300020502)

NECEC Components within HUC 8 (01030002) Watershed: HVDC, New ROW

Closest NECEC Component: HVDC, New ROW

Coordinates of Site Centroid (Lat/Long WGS 84): 45°17'43.03"N, 70°13'14.93"W

5.2 Natural Resource Inventory Summary (quantities are +/-):

Total Site Area .....120.84 acres

NWI Palustrine Wetland Area.....12.10 acres

Delineated and GPS-surveyed Palustrine Wetland Area….....14.51 acres

NHD Rivers and Streams .....3,690 feet (0.70 mile)

Delineated and GPS-surveyed Streams .....5,610 feet (1.06 miles)

Outstanding River Segment (Ch 200 §403: Dead River)…….……..…… 0.70 mile

Upland Area..... .....106.33 acres

Inland Wading Bird and Waterfowl Habitat (Moderate Value) ……..16.06 acres

Significant Vernal Pools .....1 high value SVP

Non-Significant Vernal Pools ……...1 high value PSVP

Vernal Pool Critical Terrestrial Habitat (750 feet) .....40.09 acres

Deer Wintering Area…….40 acres

5.3 Site Description

The 120.84-acre Grand Falls Tract (hereafter “GFT” or “the Tract”) – the centerpiece of which is Grand Falls (Photos 5.1 and 5.2) – is bisected by the Dead River and therefore has approximately 0.8 mile of frontage on each side of the River (Figure 5.1). GFT is a unique and stunning Tract with not only scenic views of Grand Falls and the associated display of diverse geologic features but also productive forested (PFO), scrub-shrub (PSS), and emergent (PEM) wetlands. Having a blend of cover types, GFT provides a range of habitats for a variety of animal species and includes a moderate value IWWH which connects the Tract to a 50,000-acre Focus Area of Statewide Ecological Significance. In addition to the Maine Huts and Trails network, the Northern Forest Canoe Trail traverses the Tract connecting Flagstaff Lake with Spencer Stream.

5.4 Surrounding Land Use, Protected Open Space and Focus Areas

In addition to the Maine Huts and Trails bridge (Photo 5.3), two long-established cabins are located on the Tract (one on each side of the Dead River) and a third is immediately adjacent to the west boundary (Photo 5.4). On the east bank of the Dead River, at the upstream end of the Northern Forest Canoe Trail portage which makes use of the MHT network is a simple canoe support station (Photo 5.5). Downstream of this and immediately north of a large island a relic cribwork spans the river (Photos 5.6 and 5.7). With the exception of a gated, gravel road, no other development exists on the Tract.

GFT is displayed on Figure 5.2, MLUPC's Land Use Guidance Map for Spring Lake Twp (T3 R4 BKP WKR). Much of GFT is designated as a General Management Subdistrict M-GN). In addition, the following Protection Subdistricts occur at GFT:

- P-FP – Flood Prone
- P-FW – Fish and Wildlife 060030
- P-RR – Recreation –Water
- P-SL1 – Shore Land within 250 feet of the normal high-water mark
- P-UA – Unusual Area
- P-WL1 – Wetlands of special significance (WOSS)
- P-WL2 – Wetlands scrub shrub (PSS)

GFT is approximately 3.25 miles downstream, along the Dead River, of the 50,000-acre Bigelow Mountain-Flagstaff Lake-North Branch of the Dead River Focus Area of Statewide Ecological Significance. Within the intervening distance is the 1,542-acre moderate value IWWH, linking GFT with the Focus Area. Conserved lands on the Tract are limited to the 200 feet wide Dead River Trail and Conservation Corridor on the east side of the River.

5.5 Wildlife Use

Wildlife usage and habitat evaluations on GFT were conducted based on field surveys, aerial photo interpretation of landscape and terrain, and research of IPaC results from the USFWS for endangered species, critical habitat, migratory birds, and fisheries in and around the area. According to the results of the IPaC report (Appendix 5A), two threatened species - Canada lynx (*Lynx canadensis*) and Northern long-eared bat (*Myotis septentrionalis*); and one endangered species – Atlantic salmon (*Salmo salar*) could be affected by activities on the property.

Moose (*Alces alces*) tracks were witnessed on GFT along the shore of the Dead River. Based on the location and vegetative cover in the location of P-FW (060030) on the LUPC map (Figure 5.2) an approximately 40-acre Deer Wintering Area is located along the northeast side of GFT which also extends downstream along the Dead River to Basin Tract (BT). Small mammals were observed during field surveys including red squirrel (*Sciurus vulgaris*), chipmunk (*Tamias sp*.), and snowshoe hare (*Lepus americanus*). Black bear (*Ursus americanus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*) beaver (*Castor candensis*), mink (*Neovison vison*), river otter (*Lontar canadensis*), fisher (*Pekania pennanti*) and pine marten (*Martes americana)* are furbearers that inhabit or traverse the Tract. Several passerine birds and birds of prey are likely to use GFT for its diverse habitat and abundance of food sources, including

hard and soft mast and a number of fish species. Tall balsam firs and Eastern white pines allow for birds of prey to nest along the Dead River.

The various wetland cover types, upland forest, and riverine habitat make it a suitable place for birds to reside. MDIFW has identified a moderate value 1,526 acres IWWH along the Dead River, most of which is upstream, however approximately 13 percent GFT occurs within this significant wildlife habitat.

During field surveys, one high value State Significant Vernal Pool (SVP) with over 40 spotted salamander (*Ambystoma maculatum*) egg masses was observed (Photo 5.8). One high value potentially significant vernal pool (PSVP) was recorded with twelve (12) spotted salamander egg masses, along with one potential vernal pool, all on the east side of the Dead River. Due to the timing of surveys, the presence of wood frog (*Lithobates sylvaticus*) egg masses could not be verified. American toads (*Anaxyrus americanus*) and green frogs (*Lithobates clamitans*) are other common amphibians within the Tract. Garter snakes (*Thamnophis spp*.) were present as well during field surveys.

The Upper Dead River, also referred to as the Grand Falls Flowage, is known for its rainbow trout (*Oncorhynchus mykiss*) which often feed on smelts that wash in to the river from Flagstaff Lake. Rainbow trout are a local, naturally reproducing population possibly stocked illegally many years ago. Landlocked salmon (*Salmo salar sebago*) and brook trout (*Salvelinus fontinalis*) are also abundant in the River (https://mainehuts.org/discover/things-do/fishing). These are excellent resources for birds of prey and even the occasional opportunistic black bear.

5.6 Vegetation

The property includes a variety of vegetative communities which provide different cover types, habitat characteristics, and ecological function. The property is primarily composed of mixed coniferous-deciduous forests. There are also several scrub-shrub wetlands, typically associated with the shore of the Dead River and the banks of feeder tributary streams.

Wetlands and uplands were identified in the mixed coniferous-deciduous forest mentioned above. Dominant tree species in the wetland forest include red maple (*Acer rubrum*), northern white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), and yellow birch (*Betula allegheniensis*). Common woody plants in the shrub stratum are typically saplings of balsam fir. Common understory plants include sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmunda cinnamomeum*), interrupted fern (*Osmunda claytonia*), violets (*Viola* spp.), dewberry (*Rubus hispidus*), and *Sphagnum* spp. mosses.

In the forested uplands, the dominant tree species are red spruce (*Picea rubens*), balsam fir, red maple, and eastern white pine (*Pinus strobus*). Dominant understory plants in the shrub stratum include American beech (*Fagus grandifolia*) saplings, mountain ash (*Sorbus americana*), and beaked hazelnut (*Corylus cornuta*). Common forbs include starflower (*Lysimachia borealis*), yellow blue-bead lily (*Clintonia borealis*), Canada mayflower (*Maianthemum canadense*), sarsaparilla (*Aralia nudicaulis*), and rosy bells (*Streptopus lanceolatus*).

The scrub shrub wetlands are dominated by speckled alder (*Alnus incana* ssp. *rugosa*) and meadowsweet (*Spiraea alba* var. *latifolia*). Common herbaceous plants in the understory are bluejoint grass (*Calamagrostis canadensis*), tall meadow-rue (*Thalictrum pubescens*), sedges (*Carex* spp.), and wrinkle-leaved goldenrod (*Solidago rugosa*).

5.7 Wetland Characteristics, Functions, and Values

Approximately 14.51 acres (12%) of the 120.84 total acres of the GFT were identified as palustrine wetlands during the field surveys (Figure 5.3). Although the largest wetland type on the Tract is the Dead River covering approximately 18.66 acres, characterized as a permanently flooded, lower perennial riverine system with an unconsolidated bottom (R2UBH), as discussed earlier it is excluded from total palustrine wetland area. Therefore, the second most abundant wetland type is palustrine forested with a mixed coniferous-deciduous canopy (PFO4/1) (Photo 5.9). The third most abundant wetland type (Photos 5.10 and 5.11) is palustrine scrub shrub (PSS), occurring predominantly along the shores of the Dead River in addition to the intermittent and perennial tributary streams that feed into the Dead River. The least abundant wetland system represented on the Tract is palustrine emergent (PEM, localized near the southeastern boundary of the parcel where the Dead River meanders around the island (Photo 5.12). However, despite its small extent, the PEM habitat is integral to the IWWH. The Dead River flows from the southern end of the property to the northern end of the property where it merges with Spencer Creek and turns toward the east. Accounting for both banks of the Dead River, approximately a total of 1.6 river miles of frontage occur on the Tract.

Opportunities for education and recreation abound on this Tract, along with opportunities for cultural values such as aesthetics. The falls and the surrounding ravines and bedrock provide examples of the effect of hydrology on landscape formation. The existing network of Maine Huts and Trails and the Northern Forest Canoe Trail exhibits an already-established recreational aspect to the site, such as canoeing, kayaking, rafting, fishing, and hiking.

As mapped by the USDA NRCS on Web Soil Survey, approximately 32 acres (26%) of GFT is underlain by poorly drained (PD) hydric soils. Areas of the tract where these soils occur are typically on zero to two percent slopes. Map Unit Name and Symbols for hydric soils at GFT consist of the Charles-Cornish-Wonsqueak complex (CG) a PD/VPD coarse silt loam formed in alluvial deposits on flood plains. Wetlands exist predominantly on the more gently sloping west side of the Dead River mapped as fine sandy loams whereas on the east side of the Dead River with 20 to 60 percent slopes well drained, upland soils predominate.

TABLE 5-1 SUMMARY OF FUNCTIONS & VALUES OF WETLANDS ON THE 120.84 ACRE GRAND FALLS TRACT

FUNCTION/VALUE	EXPLANATION
Groundwater Recharge/Discharge (GW)	Wetlands on river valley slopes of GFT are commonly associated with spring/seeps or sites of groundwater discharge and as part of the surface hydrologic system at other locations on GFT are recharge areas to the baseflow of the Dead River.
Flood flow Alteration (FF)	Spring Lake Twp is designated as "no data/No Specific Flood Hazard Area" (Dudley and Schalk 2006), however water levels along the Dead River are actively managed at the Long Falls Dam outlet of Flagstaff Lake by Brookfield Renewable Energy. In relation to these fluctuating water levels, a principal function of wetlands on the Grand Falls parcel that are along and hydrologically connected to the Dead River is Floodflow Alteration.
Fish and Shellfish Habitat (FH)	As observed during field surveys the Dead River at Grand Falls is popular for brook trout and landlocked salmon fishing. In 2017 the segment of the Dead River crossing T3 R4 BKP WKR where LET is located was stocked with approximately 1,550, 8- to 14-inch landlocked salmon and brook trout to support the fishery for recreational angler (MDIFW 2018). Freshwater mussels were observed along muddy shorelines of the Dead River upstream of Grand Falls.
Production Export (PE)	As evidenced by browse, droppings and other sign, woody vegetation in GFT wetlands is a fundamental food source for all herbivorous and omnivorous wildlife inhabiting the Tract. Seeds, roots and stems from herbaceous vegetation in not only PEM but PSS and PFO wetlands on GFT are also food sources for not only mammals, but the wide variety of birds, amphibians, reptiles, fish and insects that inhabit or traverse the Tract.
Sediment/Toxicant/ Pathogen Retention (STPR)	Micro-topography as well as woody and herbaceous vegetation throughout GFT wetlands physically slow surface water transport and retain these degraders of water quality to the Dead River. Sediments/toxicants/pathogens trapped with accumulation of vegetative remains as peat or other forms of hydric soils is another form of GF T wetlands protecting water quality of tributary streams and the Dead River.
Nutrient Removal (NR)	Micro-topography as well as woody and herbaceous vegetation throughout GFT wetlands slow surface water transport of nutrients protecting the Dead Rivera as well as lesser tributaries from water quality degradation (Photo 5.9). Direct uptake of nutrients by wetland vegetation and subsequent accumulation of dead vegetation in organic soils and peat is another pathway of GFT wetlands protecting water quality.
Sediment/Shoreline Stabilization (SS)	Riverine and palustrine wetlands aligned along both shores of the Dead River buffer and protect the adjoining upland shoreline from scour and erosion.
Wildlife Habitat (WH)	In addition to direct observation as well as tracks, droppings and other sign, moose, bear, deer, coyote, beaver, otter, mink and other smaller mammals are abundant on GFT that is further enhanced by the presence along the Dead River on the southern edge of the Tract of approximately 16 acres of a 1,542 acres moderate value IWWH. Based on the location and vegetative cover in the location of P-FW (060030) on the LUPC map (Figure 5.2) a Deer Wintering Area is located along the northeast side of GFT which also extends downstream along the Dead River to BT.
Educational/ Scientific Value (ED)	Educational values of GFT are recognized and promoted by a Maine Geologic Facts and Localities report by the Maine Geological Survey (Marvinney 2014). Due to proximity and connectivity, educational and scientific values of GFT are similar to those of the Bigelow Mountain-Flagstaff Lake-North Branch Dead River Focus Area of Statewide Ecological Significance (https://www.maine.gov/dacf/mnap/focusarea/bigelow_mountain_focus_area.pdf).
Recreation (REC)	GFT, crossed by the MHT network traveled by day, and through hikers is also used for camping cross country skiing and snowshoeing. The Northern Forest Canoe Trail (Photo 5.5) crosses the Tract which is the starting point for commercial Dead River rafting operation. The Tract is also regarded for trout and salmon fishing and hunting opportunities.

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5.8 Compensation

As part of the compensation package for NECEC, the approximately 120.84-acre Grand Falls Tract will be permanently protected by a conservation easement or similar instrument. Preservation of GFT (Figure 5.3) will expand on the Dead River Trail and Conservation Corridor and will encompass not only Grand Falls but also approximately 0.8 mile on each side of this reach of the Dead River which is designated as an Outstanding River Segment (Ch 200 §403). This key location will also augment Western Mountain conservation easement on the north side of the Dead River near the mouth of Spencer Stream. In addition, approximately 12 percent (14.41 acres) of the 120.84-acre GFT are comprised of a diverse mix of wetland types (PFO, PSS, PEM) with much of the PSS and PEM being part of the wetland in the Tract's 16.06-acre portion of a 1,542 acres moderate value IWWH. P-FW 060030 on the MLUPC Land Use Guidance Map (Figure 5.2) also indicates a Deer Wintering Area occurs in the northeast corner of GFT.

Two long established cabins and the Maine Huts and Trails bridge are presently the limit of residential type development at GFT. Portions of the Tract are zoned M-GN and additional development similar to the three cabins now on and immediately adjacent to GFT could therefore take place. Preservation of GFT would provide permanent protection from development and preserve the existing wetland based- wildlife, vernal pool, fish and shellfish habitats, water quality benefits, and recreational and educational opportunities.

5.9 Photographs

PHOTO 5-1 GRAND FALLS IS A HORSESHOE WATERFALL ON THE DEAD RIVER APPROXIMATELY 40 FEET TALL AND 200 FEET WIDE

PHOTO 5-2 GRAND FALLS ATTRACT VISITORS ANNUALLY FOR ITS SCENIC VIEWS AND NATURAL SPLENDOR

PHOTO 5-3 A MAINE HUTS AND TRAILS BRIDGE CROSSES THE DEAD RIVER UPSTREAM FROM GRAND FALLS

PHOTO 5-4 TWO CABINS ARE LOCATED ON THE TRACT (ONE ON EACH SIDE OF THE DEAD RIVER) AND A THIRD IS IMMEDIATELY ADJACENT TO THE WEST BOUNDARY

PHOTO 5-5 THE NORTHERN FOREST CANOE TRAIL AND THE MAINE HUTS AND TRAILS TRAIL SYSTEM PASS THROUGH THE TRACT; HERE A RACK AND A FOOD STORAGE BOX BESIDE THE PORTAGE TAKE OUT ALLOWS PADDLERS TO CARE FOR THEIR EQUIPMENT WHILE TAKING IN VIEWS OF GRAND FALLS

PHOTO 5-6 RELIC CRIBWORK LIKELY FROM HISTORIC LOGGING OPERATIONS SPANS THE WIDTH OF THE DEAD RIVER UPSTREAM FROM GRAND FALLS

PHOTO 5-7 THIS HISTORIC SIGN AND ITS RESPECTIVE CAMPSITE ARE LOCATED ON THE ISLAND, APPROXIMATELY ONE THIRD OF A MILE SOUTH OF THE BRIDGE (WARDEN MAYNARD ATWOOD OF KINGFIELD, MAINE, RETIRED IN 1984)

PHOTO 5-8 A "SIGNIFICANT VERNAL POOL" ON GFT PROVIDES HABITAT FOR SPOTTED SALAMANDER EGG MASSES

PHOTO 5-9 FORESTED WETLANDS (PFO4/1) ON GFT ARE TYPICALLY DOMINATED BY RED MAPLE, BALSAM FIR, NORTHERN WHITE CEDAR, AND YELLOW BIRCH

PHOTO 5-10 THIS TRIBUTARY STREAM TO THE DEAD RIVER IS DOMINATED BY AN ALDER SHRUB SWAMP WETLAND (PSS)

PHOTO 5-11 ALDER SHRUBLAND (PSS) OCCURS AS A FRINGE BETWEEN AN OPEN AREA AND A FORESTED WETLAND (PFO)

PHOTO 5-12 AN EMERGENT WETLAND (PEM) BORDERS THE WEST BANK OF THE DEAD RIVER, UPSTREAM FROM GRAND FALLS. FRESHWATER MUSSELS WERE FOUND ALONG THE SHORELINE IN THIS VICINITY

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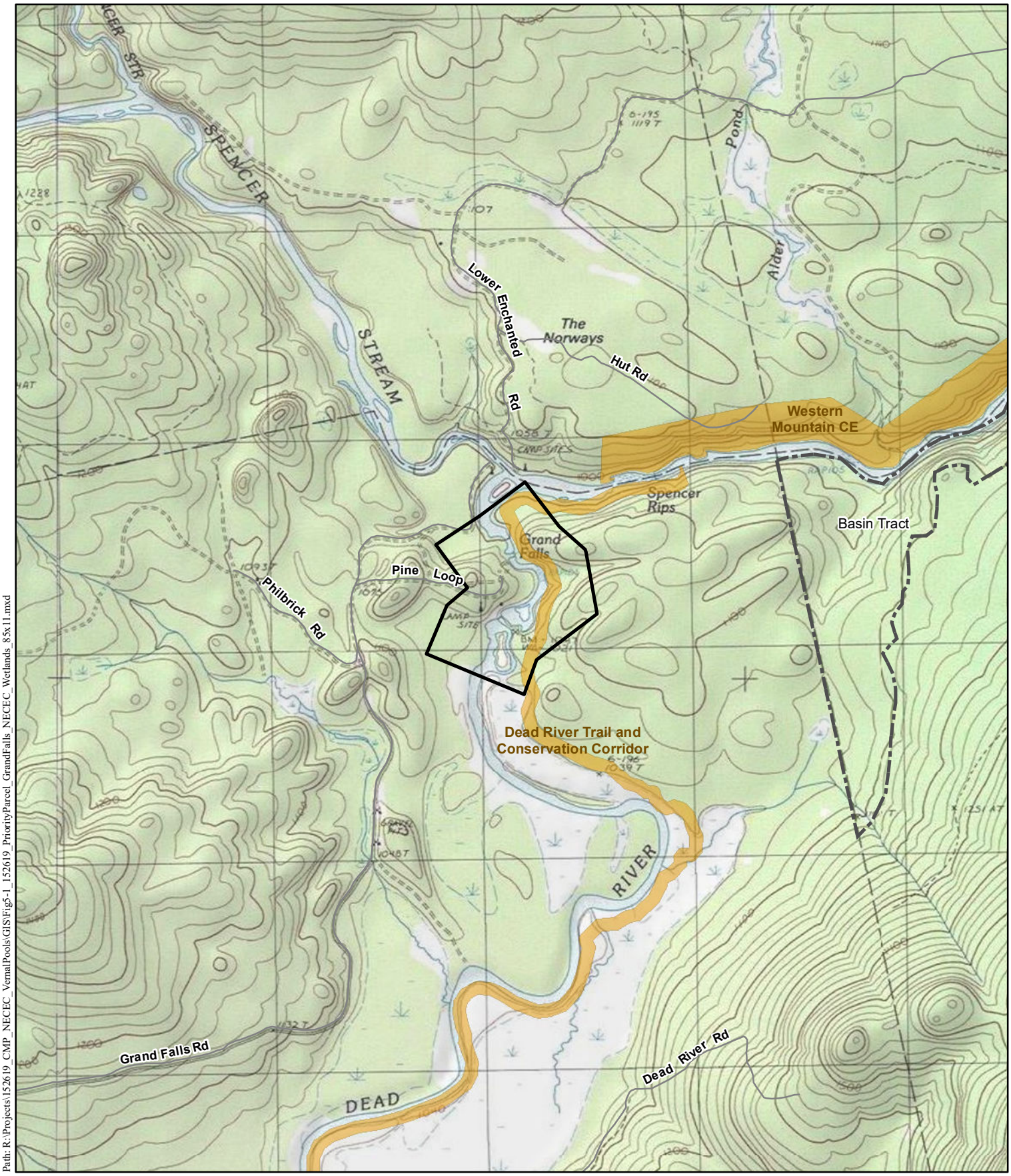

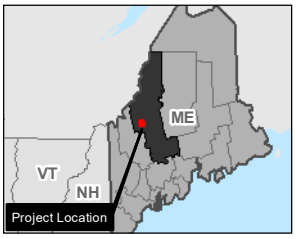

Road
Conserved Lands
Other Tract
Survey Area

N
W E
S

SCALE: 1 " = 2,000 '

0 1,000 2,000
Feet

Figure 5.1: Locus
Grand Falls Tract

Somerset County
Maine

Date:8/6/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

Path: R:\Projects\152619_CMP_NECEC_VernalPools\GIS\Fig5-1_152619_PriorityParcel_GrandFalls_NECEC_Wetlands_8.5x11.mxd

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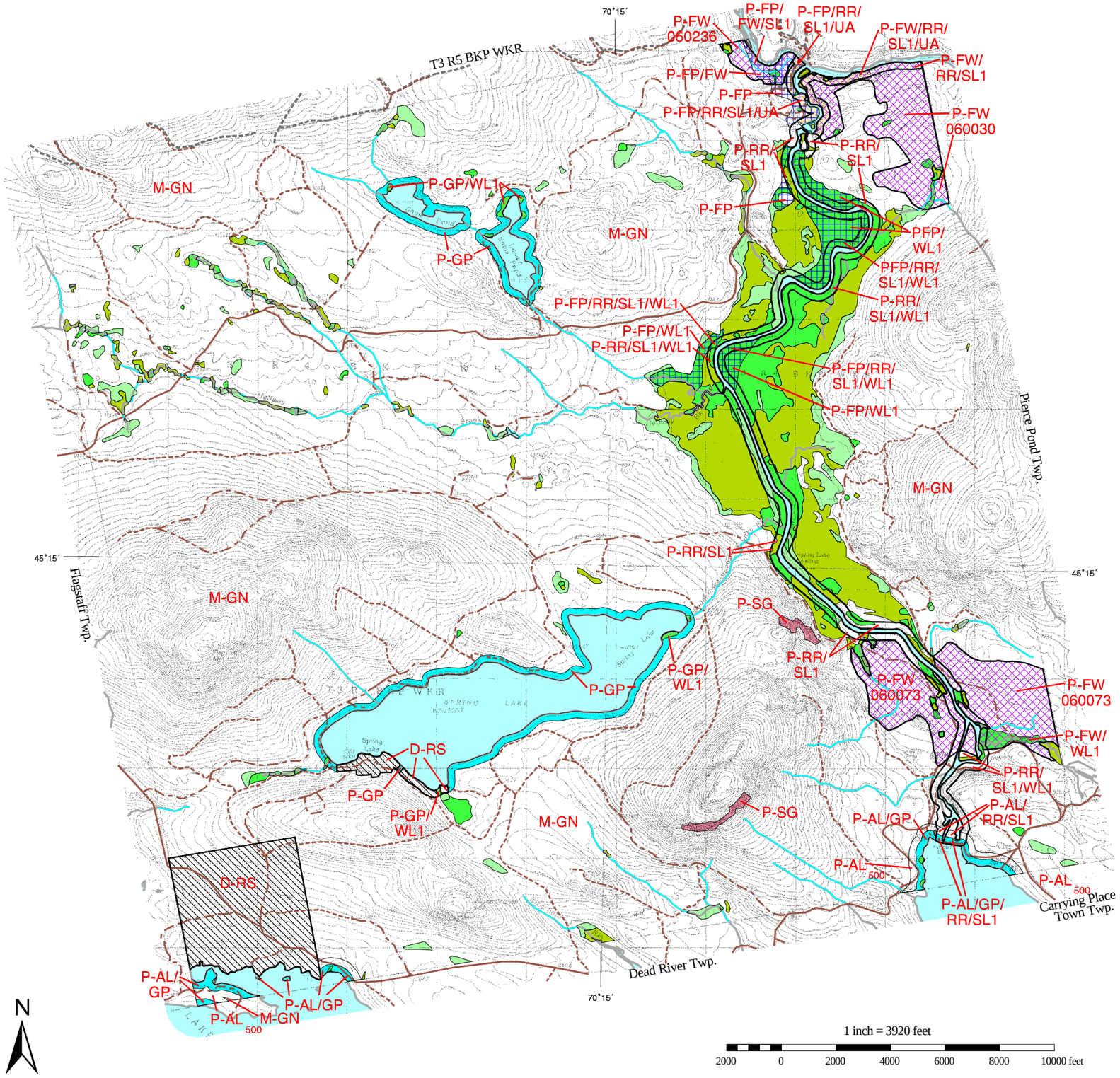
Land Use Guidance Map

T3 R4 BKP WKR

Spring Lake Twp.
Somerset County

Maine Department of Agriculture, Conservation and Forestry
LAND USE PLANNING COMMISSION
Augusta, Maine 04333−0022
(207) 287−2631
TTY (888) 577−6690
http://www.maine.gov/doc/lupc



N

1 inch = 3920 feet

2000 0 2000 4000 6000 8000 10000 feet

Legend

Development Subdistricts

D−RS Residential

Protection Subdistricts

- P−AL Accessible Lake
- P−FP Flood Prone
- P−FW Fish and Wildlife
- P−GP Great Pond
- P−RR Recreation −Water
- P−SG Soils and Geology
- P−SL1 250 ft Shoreland −Major
- P−SL2 75 ft Shoreland −Minor
- P−UA Unusual Area
- P−WL1 Wetlands − Significant
- P−WL2 Wetlands − Scrub−shrub
- P−WL3 Wetlands − Forested

Management Subdistricts

M−GN General

Water body

Improved road

Unimproved road

Trail

Areas designated as two or more protection zones are annotated with each zone, e.g. P−FP/FW/WL1, P−FP/SL1, etc., where necessary

or Subdistrict boundary

1 Zoning amendment

Topographic base, roads and trails from U.S. Geological Survey 7.5−minute map series

For the purpose of simplicity, this map does not show the Wetland Protection Subdistricts for areas identified pursuant to Section 10.16,K,2 such as beds of rivers, lakes, and other water bodies, and freshwater wetlands within 25 feet of stream channels, which are nevertheless within P−WL Subdistricts.

This map is a reduced version of the official Land Use Guidance Map. It is not certified to be a true and correct copy. Full size official LUPC Land Use Guidance Maps are available from the Commission at its Augusta office. Potential applicants unsure of their zoning should request a full size map from the Augusta office.

Land Use Guidance Map last amended on August 18, 2005

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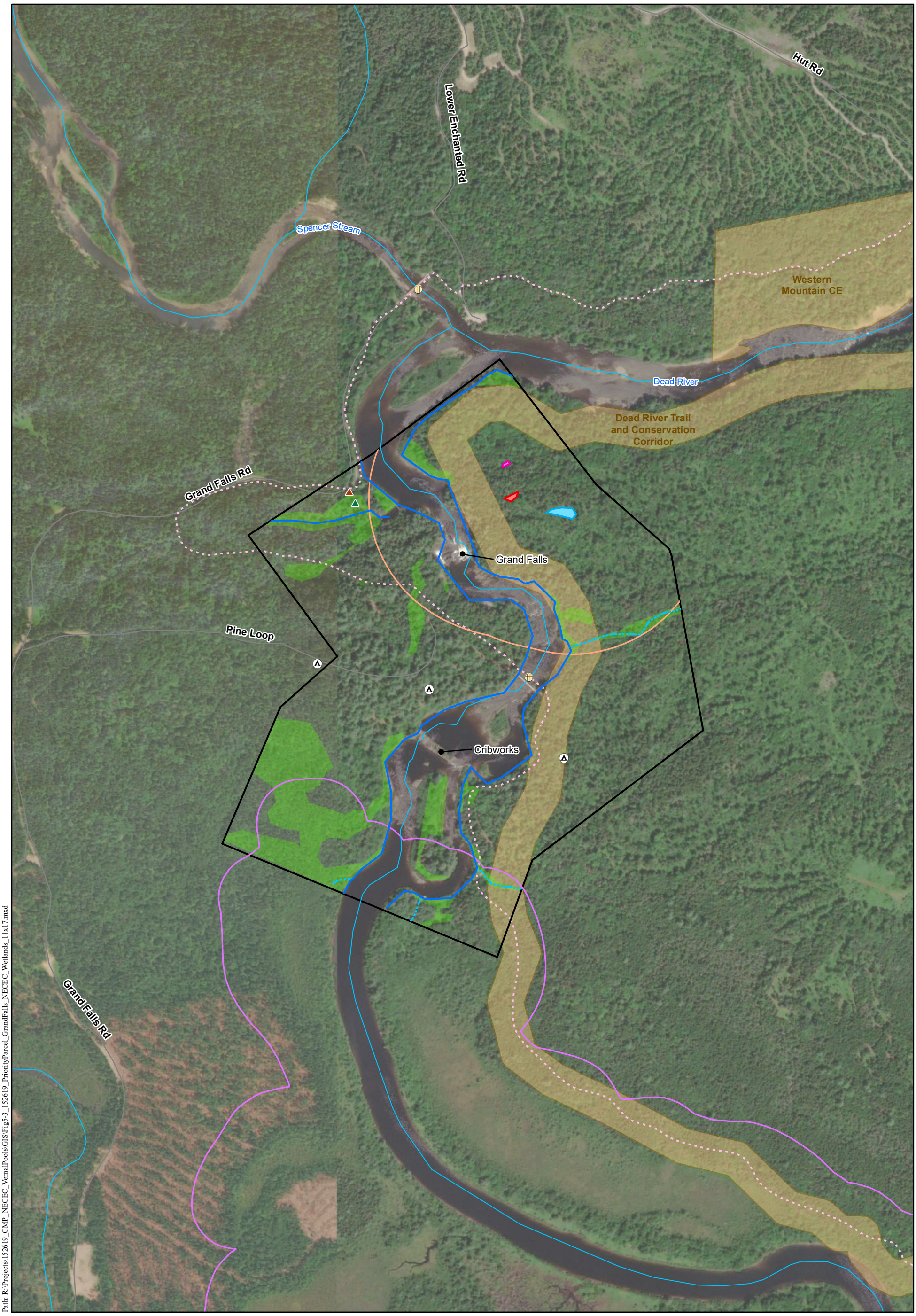

Path: R:\Projects\152619_CMP_NECEC_VernalPools\GIS\Fig5-3_152619_PriorityParcel_GrandFalls_NECEC_Wetlands_11x17.mxd

- Wetland Data Point
- Upland Data Point
- Stream (NHD)
- Maine Huts & Trails Bridge
- Cabin
- Maine Huts & Trails Main Trail
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Road
- Delineated Wetland
- Significant Vernal Pool
- Potential Significant Vernal Pool
- Potential Vernal Pool
- Critical Terrestrial Habitat (750')
- Inland Waterfowl and Wading Bird Habitat
- Conservation Land
- Survey Area

1 " = 500 '

0 250 500

Feet

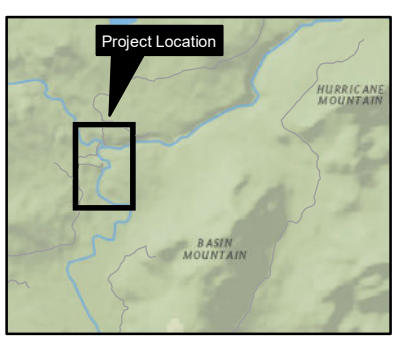

Figure 5.3: Natural Resources Grand Falls Tract

Somerset County Maine

NAD 1983 HARN StatePlane Maine West FIPS 1802 Feet Foot US
Transverse Mercator
North American 1983 HARN

Date: 8/6/2018
Author: KK
PEI: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

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APPENDIX 5A IPAC RESULTS: GRAND FALLS TRACT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Project information

NAME

Compensatory Mitigation

LOCATION

Somerset County, Maine

DESCRIPTION

GFT

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 04431

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

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

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Canada Lynx *Lynx canadensis* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

THERE ARE NO MIGRATORY BIRDS OF CONSERVATION CONCERN EXPECTED TO OCCUR AT THIS LOCATION.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

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3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

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Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1E
- PSS1/EM1E
- PFO4E
- PFO1E
- PSS1F

RIVERINE

- R3UBH
- R2UBH
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error

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is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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APPENDIX 5B VEGETATION LIST: GRAND FALLS TRACT

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Abies balsamea	Balsam Fir	Pinaceae	FAC
Acer rubrum	Red Maple	Sapindaceae	FAC
Acer saccharum	Sugar Maple	Sapindaceae	FACU
Alnus incana sp. *rugosa*	Speckled Alder	Betulaceae	FACW
Anemone quinquefolia	Nightcaps	Ranunculaceae	FACU
Aralia nudicaulis	Wild Sarsaparilla	Araliaceae	FACU
Betula alleghaniensis	Yellow Birch	Betulaceae	FAC
Calamagrostis canadensis	Bluejoint	Poaceae	OBL
Carex trisperma	Three-Seed Sedge	Cyperaceae	OBL
Carex stricta	Tussock Sedge	Cyperaceae	OBL
Chamaedaphne calyculata	Leatherleaf	Ericaceae	OBL
Chamaepericlymenum canadense	Bunchberry	Cornaceae	FAC
Clematis virginiana	Devil's Darning Needles	Ranunculaceae	FAC
Clintonia borealis	Yellow Bluebead Lily	Liliaceae	FAC
Corylus cornuta	Beaked Hazelnut	Betulaceae	FACU
Fraxinus nigra	Black Ash	Oleaceae	FACW
Gaultheria hispidula	Creeping Spicy Wintergreen	Ericaceae	FACW
Geum rivale	Purple Avens	Rosaceae	OBL
Hypericum punctatum	Spotted St. John's Wort	Hypericaceae	FAC
Ilex verticillata	Common Winterberry	Aquifoliaceae	FACW
Lysimachia borealis	Starflower	Myrsinaceae	FAC
Maianthemum canadense	Canada Mayflower	Ruscaceae	FACU
Matteuccia struthiopteris	Ostrich Fern	Onocleaceae	FAC
Onoclea sensibilis	Sensitive Fern	Onocleaceae	FACW
Osmunda claytonia	Interrupted Fern	Osmundaceae	FAC
Osmundastrum cinnamomeum	Cinnamon Fern	Osmundaceae	FACW
Picea rubens	Red Spruce	Pinaceae	FACU
Pinus strobus	Eastern White Pine	Pinaceae	FACU
Populus balsamifera	Balsam Poplar	Salicaceae	FACW
Prunus virginiana	Chokecherry	Rosaceae	FACU
Ribes lacustre	Bristly Swamp Currant	Grossulariaceae	FACW
Rubus hispidus	Bristly Dewberry	Rosaceae	FACW
Rubus idaeus	Red Raspberry	Rosaceae	FACU
Solidago canadensis	Canadian Goldenrod	Asteraceae	FACU
Solidago rugosa	Wrinkle-Leaf Goldenrod	Asteraceae	FAC
Sorbus americana	American Mountain-Ash	Rosaceae	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Spiraea alba var. *latifolia*	Meadowsweet	Rosaceae	FACW
Swida sericea	Red Osier Dogwood	Cornaceae	FACW
Thalictrum pubescens	Tall Meadow-Rue	Ranunculaceae	FACW
Thuja occidentalis	Northern White Cedar	Cupressaceae	FACW
Tiarella cordifolia	Foam Flower	Saxifragicaceae	FACU
Trillium erectum	Stinking Benjamin	Melanthiaceae	FACU
Uvularia sessilifolia	Sessile-Leaf Bellwort	Colchicaceae	FACU
Viola spp.	Violet	Violaceae	N/A
INDICATOR STATUS	OCCURRENCE IN WETLANDS (% per Reed, 1998)		
Obligate (OBL)	Almost always occurs in wetlands under natural conditions (99%)		
Facultative Wetland (FACW)	Usually in wetlands, occasionally found in non-wetlands (67- 99%)		
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands. (33-67%)		
Facultative Upland (FACU)	Usually in non-wetlands, occasionally found in wetlands (1-33%)		
Upland (UPL)	Almost always in non-wetlands under natural conditions (1%)		

[1] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17.USACE National Wetland Plant List. Web.20 June 2018.

[2] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TN-12-1, USACE Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at https://www.fws.gov/wetlands/documents/national-wetland-plant-list-indicator-rating-definitions.pdf [Verified 20 June 2018].

*Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands.* Washington, DC, USFWS.

6.0 LOWER ENCHANTED TRACT

6.1 Site Location Information

Municipality: Lower Enchanted Township **County:** Somerset

Biophysical Region: Central Mountains

Watershed (HUC 12): Enchanted Stream (010300020504),
Gulf Stream-Lower Dead River (010300020506)

NECEC Components within HUC 8 (01030002) Watershed: HVDC, New right of way

Closest NECEC Component: HVDC New ROW

Coordinates of Site Centroid (Lat/Long WGS 84): 45°19'50.89"N, 70°6'13.71"W

6.2 Natural Resource Inventory Summary (quantities are +/-):

Total Site Area .....235.60 acres

NWI Palustrine Wetland Area .....7.68 acres

Delineated and GPS-surveyed Palustrine Wetland Area .....12.97 acres

NHD Rivers and Streams .....19,210 feet (3.64 miles)

Outstanding River Segment (Ch 200 §403: Dead River)……..……..2.3 miles

Delineated and GPS-surveyed Rivers and Streams.....22,620 feet (4.28 miles)

Upland Area.....222.63 acres

Significant Vernal Pools .....None

Non-Significant Vernal Pools ……..1 high value PSVP, 5 low value VPs

Vernal Pool Critical Terrestrial Habitat (750 feet)..... 84.46 acres

6.3 Site Description

The approximately 235.60-acre Lower Enchanted Tract (hereafter “LET” or “the Tract”) has a configuration similar to an inverted “T” with approximately 1.33 miles of frontage on each side of Enchanted Stream (Photos 6.1 and 6.2) and 2.30 miles of frontage along the north side of the Dead River (Figure 6.1). Access to the east side of the LET is by Whiskey Springs Road from Lower Enchanted Road, from which a former logging road also leads to the west side of the Tract.

Although extensive timber harvesting has occurred on each side of Enchanted Stream to the Dead River, the entirety of LET remains essentially uncut and therefore contains a 3.63-mile undisturbed riparian corridor. Widths of the Tract along Enchanted Stream range from 250 to 1,050 feet and are typically 200 feet and 300 feet on the east and west sides, respectively, whereas along the Dead, widths range from 300 to 900 feet with representative widths on the upstream and downstream segments of 400 and 700 feet, respectively.

6.4 Surrounding Land Use, Protected Open Space and Focus Areas

Lower Enchanted Stream is spanned by a bridge on LET that is part of the Maine Huts and Trails network along the length of the Dead River (Figure 6.2, Photo 6.3). The Dead River (Photo 6.4) is heavily used by rafters and from Whiskey Springs Road; an appendage on the east side of the Tract provides emergency access to the River. Lower Enchanted Stream and the Dead River are also popular for brook trout (*Salvelinus fontinalis*) and landlocked salmon (*Salmo salar sebago*) fishing. In 2017, the segment of the Dead River crossing T3 R4 BKP WKR where LET is located was stocked with approximately 1,550, 8- to 14-inch landlocked salmon and brook trout to support the fishery for recreational anglers (MDIFW 2018). The northern tip of LET is within 150 feet of the southern terminus of a moderate value IWWH associated with Lower Enchanted Pond. There are no Focus Areas immediately adjacent to or within one mile of LET.

LET is displayed on Figure 6.2, MLUPC's Land Use Guidance Map for Lower Enchanted Twp. (T2 R5 BKP WKR). Most of LET is designated as a General Management Subdistrict M-GN). In addition, the following Protection Subdistricts occur at LET:

- P-RR – Recreation –Water
- P-SL1 – Shore Land within 250 feet of the normal high-water mark
- P-WL2 – Wetlands scrub shrub (PSS)
- P-WL3 – Wetlands forested wetlands (PFO)

6.5 Wildlife Use

Wildlife usage and habitat evaluations on LET were conducted based on field surveys, aerial photo interpretation of landscape and terrain, and research of IPaC results from the USFWS for endangered species, critical habitat, migratory birds, and fisheries in and around the area. According to the results of the IPaC report (Appendix 6A), two threatened species: Canada lynx (*Lynx canadensis*) and Northern long-eared bat (*Myotis septentrionalis*); and one endangered species – Atlantic salmon (*Salmo salar*) could be affected by activities on the property.

Bald eagles (*Haliaeetus leucocephalus*) likely make use of the LET riparian corridor. The wide Dead River valley lined with tall trees along the shoreline and valley walls is an ideal habitat area for bald eagles and other birds of prey. This allows for the birds to nest high and have a 360-degree view as well as have abundant fishing in the River. A pair of common ravens (*Corvus corax*) was observed sounding alarm calls as field crews approached what was likely their nest.

White-tailed deer (*Odocoileus virginianus*) and moose (*Alces alces*) droppings were observed, mainly on the gentler slopes of the Tract. American beech (*Fagus grandifolia*) is a common upland tree species and beech nuts, is a prevalent food source for deer, Eastern gray squirrel (*Sciurus carolinensis*), red squirrel (*Sciurus vulgaris*), chipmunks (*Tamias sp*.), and black bear (*Ursus americanus*). Coyote (*Canis latrans*), red fox (*Vulpes vulpes*) beaver (*Castor candensis*), mink (*Neovison vison*), river otter (*Lontar canadensis*), fisher (*Pekania pennanti*) and pine marten (*Martes americana)* are furbearers that inhabit or traverse the Tract.

Several pools harboring indicator species egg masses were observed on site including five low value natural vernal pools (VP) and one high value potentially significant vernal pool (PSVP) (Photo 6.5). Due to survey timing, only spotted salamander (*Ambystoma maculatum*) egg masses were observed, though the presence of wood frogs (*Lithobates sylvaticus*) is likely as well. American toads (*Anaxyrus americanus*) and green frogs (*Lithobates clamitans*) are other common amphibians observed within the Tract. Garter snakes (*Thamnophis spp*.) were also observed during field visits.

6.6 Vegetation

This Tract includes a variety of vegetative communities which provide different cover types and habitat characteristics. The Tract is primarily composed of mature forest, portions of which include dominantly deciduous and areas of mixed-growth (coniferous and deciduous) forest. In addition, there are also large areas of scrub-shrub communities, generally present along the periphery of the river. The eastern and western boundaries of the upstream portion of the parcel are characterized by early successional forests, predominantly big-toothed aspen (*Populus grandidentata*), balsam fir (*Abies balsamea*), paper birch (*Betula papyrifera*) and red spruce (*Picea rubens*).

Wetlands and uplands were identified in each type of vegetative community mentioned above. Dominant tree species in the upland forest are eastern hemlock (*Tsuga canadensis*), balsam fir, red spruce, and sugar maples (*Acer saccharum*). The shrub and sapling understory layer of the upland forest includes beaked hazelnut (*Corylus cornuta*), hobblebush (*Viburnum lantanoides*), and striped maple (*Acer pennsylvanicum*). Common forbs in the upland forest are painted trillium (*Trillium undulatum*), red trillium (*Trillium erectum*), yellow blue-bead lily (*Clintonia borealis*), and sarsaparilla (*Aralia nudicaulis*).

Forested wetlands (PFO) are dominated by red maple (*Acer rubrum*), balsam fir, yellow birch (*Betula allegheniensis*), northern white cedar (*Thuja occidentalis*), and black ash (*Fraxinus nigra*). The dominant understory plant in the PFO is sensitive fern (*Onoclea sensibilis*). The scrub-shrub wetlands (PSS) are dominated by speckled alder (*Alnus incana* ssp. *rugosa*) and meadowsweet (*Spiraea alba* var. *latifolia*), with occasional abundance of steeplebush (*Spiraea tomentosa*) and willow (*Salix* spp.). Herbaceous plants found in the shrublands are dominated by bluejoint grass (*Calamagrosits canadensis*), American false hellebore (*Veratrum viride*), and a suite of sedges (*Carex* spp.) and bulrushes (*Scirpus* spp.).

6.7 Wetland Characteristics, Functions and Values

Approximately 12.97 acres (5.5%) of the 235.60 total acres of the LET were identified as palustrine wetlands during the field surveys (Figure 5.3). Although the largest wetland type on the Tract is the Enchanted Stream covering approximately 6.67 acres, characterized as a permanently flooded, lower perennial riverine system with an unconsolidated bottom (R3UBH), as discussed earlier it is excluded from total palustrine wetland area. Accounting for both banks, LET contains approximately 2.7 miles of frontage along the Enchanted Stream. The Enchanted Stream flows southeast through the Tract to the Dead River (Photo 6.4). The Tract has a total of approximately 2.3 miles of frontage on the Dead River, including sections both upstream and downstream of the mouth of Enchanted Stream. The second most abundant wetland type is palustrine scrub shrub (PSS), typically displayed as a speckled alder thicket growing within the floodplain of the riverine system (Photo 6.6). The least abundant wetland type is palustrine forested, which typically occurs at the toe of slope between the Enchanted Stream and the steep hillsides along the stream valley. Variations of forested wetland (Photo 6.7) occur across LET such as those dominated by deciduous trees (PFO1) and those dominated by mixed coniferous-deciduous canopy (PFO4/1).

As mapped by the USDA NRCS on Web Soil Survey, the entire Lower Enchanted Tract consists of somewhat excessively drained (SED), well drained (WD), or moderately well drained (MWD) soils with slopes ranging between 15 and 60 percent. Due to the steep valley walls on both sides of Enchanted Stream any surface and groundwater rapidly flows directly to the stream channel, or are hillside seep wetlands delineated during field surveys (Photo 6.8). The Dead River valley contains a larger area of flatter slopes allowing for a higher abundance of poorly drained, hydric soils. Hydric soils were observed predominantly along the shores of Enchanted Stream and the Dead River.

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TABLE 6-1 SUMMARY OF FUNCTIONS & VALUES OF WETLANDS ON THE 235.60-ACRE LOWER ENCHANTED TRACT

FUNCTION/VALUE	EXPLANATION
Groundwater Recharge/Discharge (GW)	Wetlands on river valley slopes of LET are commonly associated with spring/seeps or sites of groundwater discharge and as part of the surface hydrologic system at other locations on LET are recharge areas to the baseflow of Enchanted Stream and the Dead River (Photo 6.8).
Flood flow Alteration (FF)	Lower Enchanted Twp is designated as "no data/No Specific Flood Hazard Area" (Dudley and Schalk 2006), however water levels along the Dead River are actively managed at the Long Falls Dam outlet of Flagstaff Lake by Brookfield Renewable Energy. In relation to these fluctuating water levels, a principal function of wetlands on the Lower Enchanted parcel that are along and hydrologically connected to the Dead River is Floodflow Alteration.
Fish and Shellfish Habitat (FH)	Lower Enchanted Stream and the Dead River are popular for brook trout and landlocked salmon fishing. In 2017, the segment of the Dead River crossing T3 R4 BKP WKR where LET is located was stocked with approximately 1,550, 8- to 14-inch landlocked salmon and brook trout to support the fishery for recreational angler (MDIFW 2018). Freshwater mussels observed upstream and downstream on GFT and BT along muddy shorelines of the Dead River are also likely to inhabit similar substrate on LET.
Production Export (PE)	As evidenced by browse, droppings and other sign, woody vegetation in LET wetlands is a fundamental food source for all herbivorous and omnivorous wildlife inhabiting the Tract. Seeds, roots and stems from herbaceous vegetation in not only PEM but PSS and PFO wetlands on GFT are also food sources for not only mammals, but the wide variety of birds, amphibians, reptiles, fish and insects that inhabit or traverse the Tract.
Sediment/Toxicant/ Pathogen Retention (STPR)	Micro-topography as well as woody and herbaceous vegetation throughout LET wetlands physically slow surface water transport and retain these degraders of water quality to the Dead River. Sediments/toxicants/pathogens trapped with accumulation of vegetative remains as peat or other forms of hydric soils is another form of LET wetlands protecting water quality of tributary streams and the Dead River.
Nutrient Removal (NR)	Micro-topography as well as woody and herbaceous vegetation throughout LET wetlands slow surface water transport of nutrients protecting the Dead River as well as lesser tributaries from water quality degradation. Direct uptake of nutrients by wetland vegetation and subsequent accumulation of dead vegetation in organic soils and peat is another pathway of LET wetlands protecting water quality.
Sediment/Shoreline Stabilization (SS)	Riverine and palustrine wetlands aligned along the north shore of the Dead River and both shores of Enchanted Stream buffer and protect the adjoining upland shoreline from scour and erosion (Photo 6.6).
Wildlife Habitat (WH)	In addition to direct observation as well as tracks, droppings and other sign, moose, bear, deer, coyote, beaver, otter, mink and other smaller mammals are abundant on LET. The northern tip of LET is within 150 feet of the southern terminus of a 276-acre moderate value IWWH associated with Lower Enchanted Pond.
Educational/ Scientific Value (ED)	Although there appear to be no records of educational use or scientific research, attributes of LET including the baseline of mapped resources and its remote location along riparian corridors of Enchanted Stream and the Dead River could be relevant to further study.
Recreation (REC)	LET is crossed by the MHT network traveled by day, and through hikers that is also used for camping cross country skiing and snowshoeing (Photo 6.3). Commercial river rafting on the Dead River pass along the shoreline of the Tract which also provides emergency access to the river. Enchanted Stream as well as the Dead River are regarded for trout and salmon fishing. Hunting opportunities are another recreational value of the Tract and its wetlands.

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6.8 Compensation

As part of the compensation package for NECEC, the approximately 235.60-acre Lower Enchanted Tract will be permanently protected by a conservation easement or similar instrument. Preservation of LET will link segments of and expand on the Western Mountain Conservation Easement and will encompass approximately 0.7 mile on both sides of Enchanted Stream as well as 2.3 miles along the north shoreline of the Dead River (Figure 6.3) which is designated as an Outstanding River Segment (Ch 200 §403). In addition, approximately 5.5 percent (12.97 acres) of the 235.60-acre LET are comprised of a mix of PSS and PFO riparian wetland.

Most of the Tract is zoned M-GN, and easily accessible by Whiskey Springs Road. Development of this otherwise undeveloped riparian Tract could therefore occur. Preservation of LET would provide permanent protection from development and preserve the existing wetland based-wildlife, vernal pool, fish and shellfish habitats, water quality benefits, and recreational, and educational values of this Tract.

6.9 Photographs

PHOTO 6-1 AN UPSTREAM VIEW FROM THE MHT BRIDGE DISPLAYS A POOL ON LOWER ENCHANTED STREAM

PHOTO 6-2 A DOWNSTREAM VIEW FROM THE MHT BRIDGE OF RIFFLES/RAPIDS ON LOWER ENCHANTED STREAM

PHOTO 6-3THE MHT TRAIL CROSSES LET LOCATED APPROXIMATELY FIVE MILES DOWNSTREAM ON THE DEAD RIVER FROM THE GRAND FALLS HUT

PHOTO 6-4 THE CONFLUENCE OF LOWER ENCHANTED STREAM (LEFT) AND THE DEAD RIVER (RIGHT SIDE) IS LOCATED NEAR THE CENTER OF THE TRACT.

PHOTO 6-5 A POTENTIALLY SIGNIFICANT VERNAL POOL (PSVP) FOUND ON THE EAST SIDE OF LOWER ENCHANTED STREAM PROVIDES HABITAT FOR SPOTTED SALAMANDER EGG MASSES, AS WELL AS OTHER ADULT AMPHIBIANS

PHOTO 6-6 SCRUB SHRUB FLOODPLAIN WETLANDS ARE ABUNDANT ALONG THE BANKS OF THE LOWER ENCHANTED STREAM (RIGHT SIDE OF PHOTO) AND ARE TYPICALLY DOMINATED BY SPECKLED ALDER AND MEADOWSWEET

PHOTO 6-7 A FORESTED WETLAND (PFO) OCCURS THROUGHOUT THE TRACT BETWEEN THE TOE OF SLOPE (AT LEFT) AND LOWER ENCHANTED STREAM

PHOTO 6-8 SEVERAL TRIBUTARY STREAMS RUN DOWN THE STEEP SLOPES OF THE VALLEY, ULTIMATELY DRAINING INTO THE LOWER ENCHANTED STREAM

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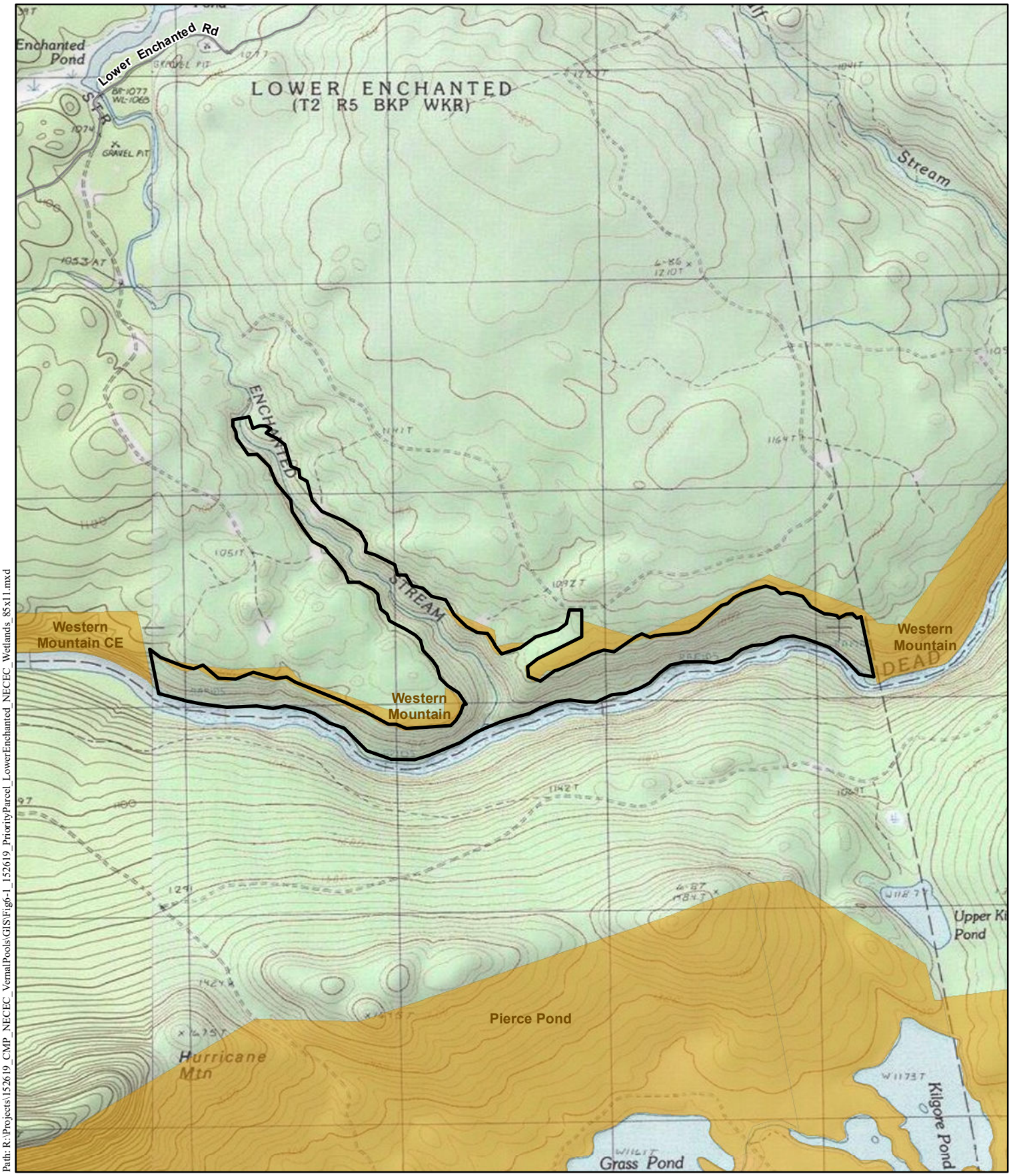

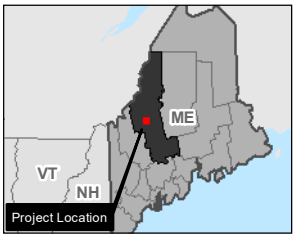

Road
Conserved Lands
Survey Boundary

N
W E
S

SCALE: 1 " = 2,000 '

0 1,000 2,000
Feet

Figure 6.1: Locus
Lower Enchanted Tract

Somerset County
Maine

Date:8/6/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER
POWER ENGINEERS

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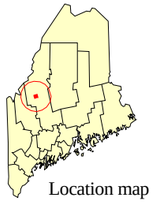
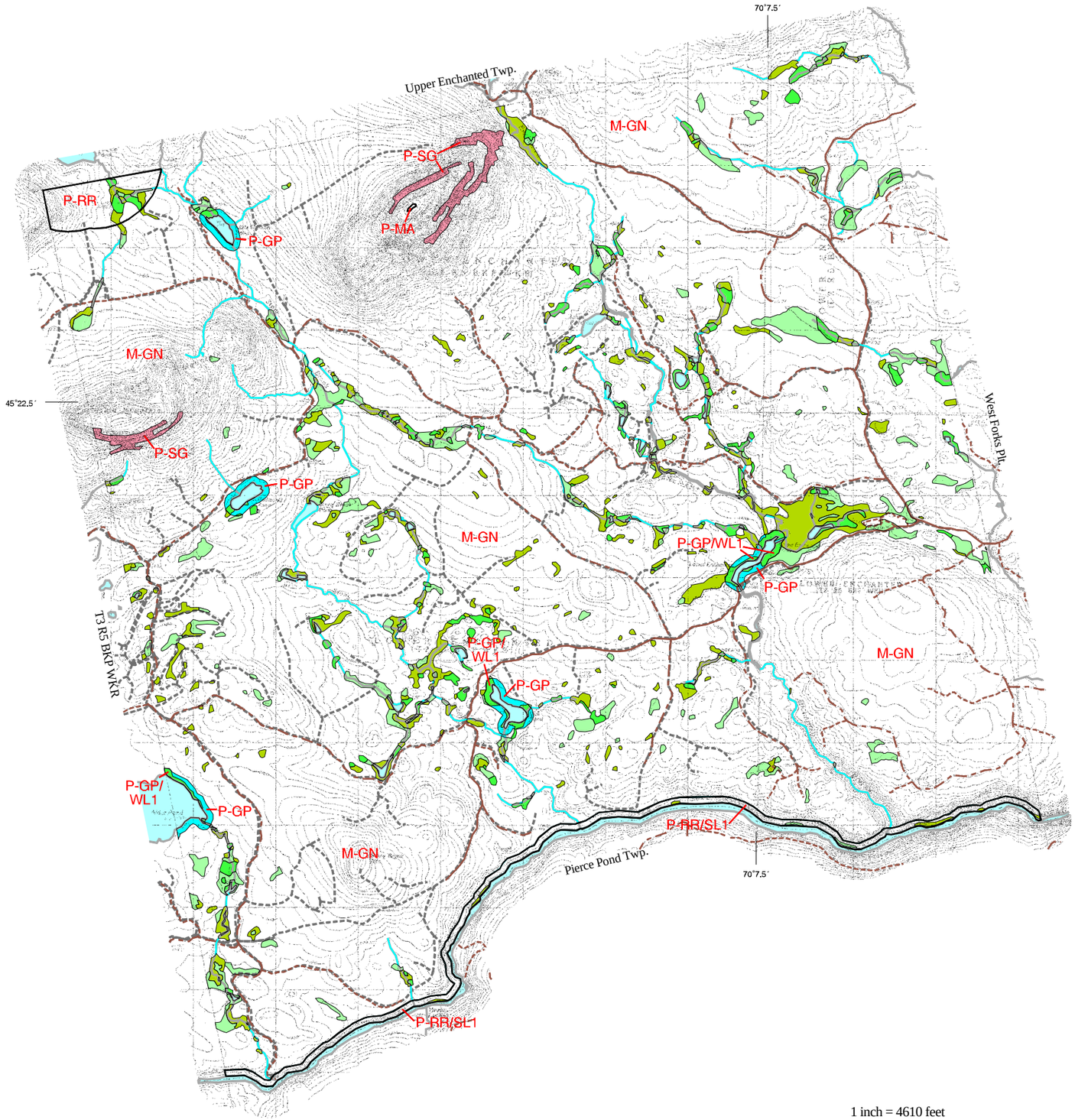
Land Use Guidance Map

Lower Enchanted Twp.

T2 R5 BKP WKR
Somerset County



Maine Department of Agriculture, Conservation and Forestry
LAND USE PLANNING COMMISSION
Augusta, Maine 04333−0022
(207) 287−2631
TTY (888) 577−6690
http://www.maine.gov/doc/lupc



N

1 inch = 4610 feet

2000 0 2000 4000 6000 8000 10000 feet

Legend

Development Subdistricts

Protection Subdistricts

- P−GP Great Pond
- P−MA Mountain Area
- P−RR Recreation −Water
- P−SG Soils and Geology
- P−SL1 250 ft Shoreland −Major
- P−SL2 75 ft Shoreland −Minor
- P−WL1 Wetlands − Significant
- P−WL2 Wetlands − Scrub−shrub
- P−WL3 Wetlands − Forested

Management Subdistricts

- M−GN General

- Water body
- Improved road
- Unimproved road
- Trail

Areas designated as two or more protection zones are annotated with each zone, e.g. P−FP/FW/WL1, P−FP/SL1, etc., where necessary

—— or —— Subdistrict boundary
(1) Zoning amendment

Topographic base, roads and trails from U.S. Geological Survey 7.5−minute map series

For the purpose of simplicity, this map does not show the Wetland Protection Subdistricts for areas identified pursuant to Section 10.16,K,2 such as beds of rivers, lakes, and other water bodies, and freshwater wetlands within 25 feet of stream channels, which are nevertheless within P−WL Subdistricts.

This map is a reduced version of the official Land Use Guidance Map. It is not certified to be a true and correct copy. Full size official LUPC Land Use Guidance Maps are available from the Commission at its Augusta office. Potential applicants unsure of their zoning should request a full size map from the Augusta office.

Land Use Guidance Map last amended on August 18, 2005

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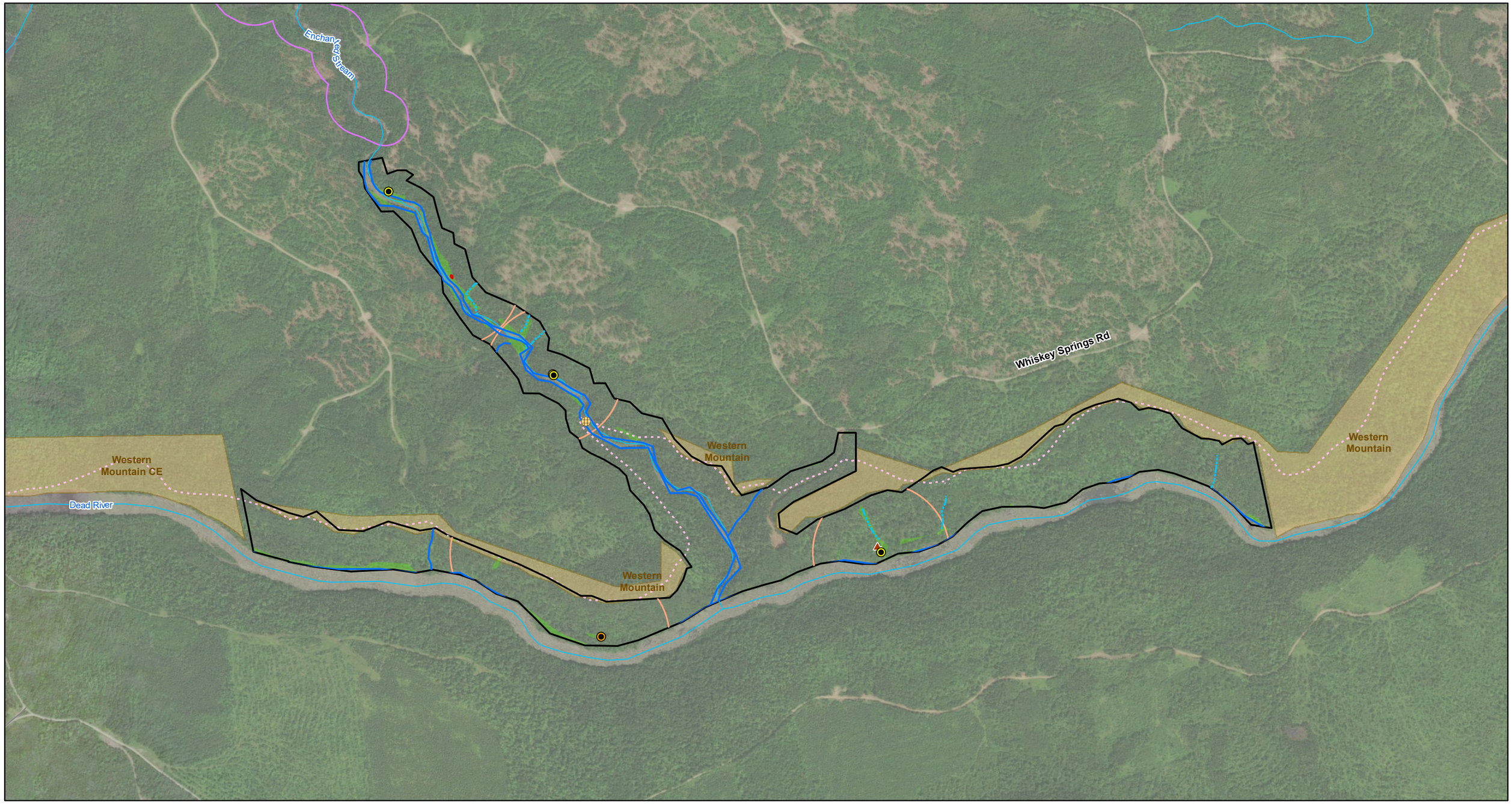

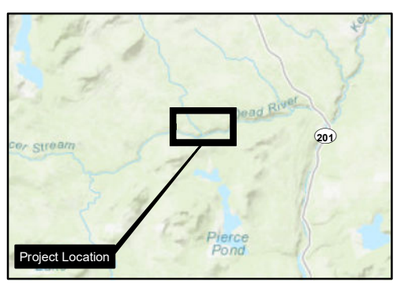

- Corps Vernal Pool
- Vernal Pool
- Wetland Data Point
- Upland Data Point
- Maine Huts & Trails Bridge
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Stream (NHD)
- Critical Terrestrial Habitat (750')
- Potential Significant Vernal Pool
- Inland Waterfowl and Wading Bird Habitat
- Survey Area
- Maine Huts & Trails Main Trail
- Road
- Delineated Wetland
- Conservation Land

Figure 6.3: Natural Resources
Lower Enchanted Tract

Somerset County, Maine

DRAFT

0 500 1,000 2,000
Feet

1 " = 1,000 '

Page 1 of 1

Central Maine Power
NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

Date: 8/6/2018; Author: KK; Project: 152619

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APPENDIX 6A IPAC RESULTS: LOWER ENCHANTED TRACT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Project information

NAME

Compensatory Mitigation

LOCATION

Somerset County, Maine

DESCRIPTION

LET

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 04431

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

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NOT FOR CONSULTATION

Canada Lynx *Lynx canadensis* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

NOT FOR CONSULTATION

Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds

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guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize

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potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1C
- PFO1C
- PSS1E

RIVERINE

- R3UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

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Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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APPENDIX 6B VEGETATION LIST: LOWER ENCHANTED TRACT

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Abies balsamea	Balsam Fir	Pinaceae	FAC
Acer rubrum	Red Maple	Sapindaceae	FAC
Acer saccharum	Sugar Maple	Sapindaceae	FACU
Actaea pachypoda	Doll's Eyes	Ranunculaceae	UPL
Alnus incana ssp. *rugosa*	Speckled Alder	Betulaceae	FACW
Anemone canadensis	Round-Leaf Thimbleweed	Ranunculaceae	FACW
Anemone quinquefolia	Nightcaps	Ranunculaceae	FACU
Aralia nudicaulis	Wild Sarsaparilla	Araliaceae	FACU
Arisaema triphyllum	Jack-in-the-Pulpit	Araceae	FAC
Athyrium angustum	Northern Lady Fern	Woodsiaceae	FAC
Betula alleghaniensis	Yellow Birch	Betulaceae	FAC
Calamagrostis canadensis	Bluejoint	Poaceae	OBL
Cardamine diphylla	Crinkle Root	Brassicaceae	FACU
Carex leptalea	Bristly-Stalk Sedge	Cyperaceae	OBL
Carex spp.	Sedge	Cyperaceae	N/A
Clintonia borealis	Yellow Bluebead Lily	Liliaceae	FAC
Corylus cornuta	Beaked Hazelnut	Betulaceae	FACU
Dichanthelium sp.	Rosette Grass	Poaceae	N/A
Eleocharis acicularis	Needle Spike-Rush	Cyperaceae	OBL
Equisetum scirpoides	Dwarf Scouring-Rush	Equisetaceae	FAC
Equisetum sylvaticum	Woodland Horsetail	Equisetaceae	FACW
Fagus grandifolia	American Beech	Fagaceae	FACU
Fraxinus americana	White Ash	Oleaceae	FACU
Fraxinus nigra	Black Ash	Oleaceae	FACW
Fraxinus pennsylvanica	Green Ash	Oleaceae	FACW
Galium aparine	Sticky-Willy	Rubiaceae	FACU
Galium palustre	Common Marsh Bedstraw	Rubiaceae	OBL
Geum rivale	Purple Avens	Rosaceae	OBL
Gymnocarpium dryopteris	Northern Oak Fern	Woodsiaceae	FACU
Lysimachia borealis	Starflower	Myrsinaceae	FAC
Maianthemum canadense	Canada Mayflower	Ruscaceae	FACU
Matteuccia struthiopteris	Ostrich Fern	Onocleaceae	FAC
Medeola virginiana	Indian Cucumber-Root	Liliaceae	FACU
Onoclea sensibilis	Sensitive Fern	Onocleaceae	FACW
Osmunda claytonia	Interrupted Fern	Osmundaceae	FAC
Osmundastrum cinnamomeum	Cinnamon Fern	Osmundaceae	FACW

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Parathelypteris novaborecensis	New York Fern	Thelypteridaceae	FAC
Phegopteris connectilis	Narrow Beech Fern	Thelypteridaceae	FACU
Picea rubens	Red Spruce	Pinaceae	FACU
Pinus strobus	Eastern White Pine	Pinaceae	FACU
Populus balsamifera	Balsam Poplar	Salicaceae	FACW
Populus grandidentata	Big-Tooth Aspen	Salicaceae	FACU
Populus tremuloides	Quaking Aspen	Salicaceae	FACU
Prunus virginiana	Chokecherry	Rosaceae	FACU
Ribes glandulosum	Skunk Currant	Grossulariaceae	FACW
Ribes sp.	Currant	Grossulariaceae	N/A
Rubus idaeus	Red Raspberry	Rosaceae	FACU
Rubus hispidus	Bristly Dewberry	Rosaceae	FACW
Salix sp.	Willow	Salicaceae	N/A
Spiraea alba var. latifolia	Meadowsweet	Rosaceae	FACW
Streptopus lanceolatus	Rosy Bells	Liliaceae	FACU
Swida sericea	Red Osier Dogwood	Cornaceae	FACW
Thalictrum pubescens	Tall Meadow-Rue	Ranunculaceae	FACW
Thuja occidentalis	Northern White Cedar	Cupressaceae	FACW
Tiarella cordifolia	Heart-Leaf Foamflower	Saxifragicaceae	FACU
Trillium erectum	Stinking Benjamin	Melanthiaceae	FACU
Trillium undulatum	Painted Trillium	Melanthiaceae	FACU
Tsuga canadensis	Eastern Hemlock	Pinaceae	FACU
Tussilago farfara	Colt's-Foot	Asteraceae	FACU
Uvularia sessilifolia	Sessile-Leaf Bellwort	Colchicaceae	FACU
Veratrum viride	American False Hellebore	Melanthiaceae	FACW
Viburnum lantanoides	Hobblebush	Adoxaceae	FACU
Viola spp.	Violet	Violaceae	N/A
INDICATOR STATUS	OCCURRENCE IN WETLANDS (% per Reed, 1998)		
Obligate (OBL)	Almost always occurs in wetlands under natural conditions (99%)		
Facultative Wetland (FACW)	Usually in wetlands, occasionally found in non-wetlands (67- 99%)		
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands. (33-67%)		
Facultative Upland (FACU)	Usually in non-wetlands, occasionally found in wetlands (1-33%)		
Upland (UPL)	Almost always in non-wetlands under natural conditions (1%)		

[1] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17.USACE National Wetland Plant List. Web.20 June 2018.

[2] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TN-12-1, USACE Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at https://www.fws.gov/wetlands/documents/national-wetland-plant-list-indicator-rating-definitions.pdf [Verified 20 June 2018].*Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands.* Washington, DC, USFWS.

7.0 BASIN TRACT

7.1 Site Location Information

Municipality: Pierce Pond Township **County:** Somerset

Biophysical Region: Western Mountains

Watershed (HUC 12): Gulf Stream-Lower Dead River (010300020506)
Spring Lake-Upper Dead River (010300020502)

NECEC Components within HUC 8 (01030002) Watershed: HVDC, New ROW

Closest NECEC Component: HVDC New right of way

Coordinates of Site Centroid (Lat/Long WGS 84): 45°18'22.94"N, 70°10'43.99"W

7.2 Natural Resource Inventory Summary (quantities are +/-):

Total Site Area .....697.06 acres

NWI Palustrine Wetland Area.....9.73 acres

Delineated and GPS-surveyed Palustrine Wetland Area.....63.37acres

NHD Rivers and Streams.....25,750 feet (4.88 miles)

Delineated and GPS-surveyed Rivers and Streams.....35,210 feet (6.67 miles)

Outstanding River Segment (Ch 200 §403: Dead River)…… 4.16 miles

Upland Area..... .....633.69 acres

Significant Vernal Pools .....None

Other Non-Significant Vernal Pools Types……1 low value VP, 1 low value CVP, 4 PVP

Vernal Pool Critical Terrestrial Habitat (750 feet) .....69.56 acres

Deer Wintering Area……180 acres

7.3 Site Description

The approximately 697.06-acre Basin Tract (hereafter “BT” or “the Tract”) is located on the north side of Basin and Hurricane Mountains and has approximately 4.2 miles of frontage along the south side of the Dead River (Figure 7.1, Photos 7.1 and 7.2). Widths of the Tract from the Dead River range between approximately 300 and 5,780 feet at the west property line which coincides with the township boundary shared by T2R4 (Pierce Pond) and T3R4. In the vicinity of a perennial stream near the Tract’s mid-length along the Dead River, the width is approximately 2,800 feet, upstream and downstream of which representative widths of BT are 1,500 and 1,200 feet, respectively.

Timber harvesting occurred along the southern side of the Tract since September 2013, however along the Dead River, the entirety of BT remains uncut and is therefore a 4.2-mile undisturbed riparian corridor. Access to the east end of BT is from North Bowtown road and the west end can be reached on foot from the Maine Huts and Trails across the Dead River bridge at Grand Falls.

7.4 Surrounding Land Use, Protected Open Space and Focus Areas

BT has no cabins or trails, but does have a campsite along the Dead River (Photos 7.3 and 7.4) and is otherwise undeveloped. The Tract is displayed on Figure 7.3, MLUPC's Land Use Guidance Map for Pierce Pond Twp. (T2 R4 BKP WKR). Most of BT is designated as General Management Subdistrict M-GN). In addition, the following Protection Subdistricts occur at BT:

- P-FW – Fish and Wildlife 060030
- P-RR – Recreation –Water
- P-SL1 – Shore Land within 250 feet of the normal high-water mark
- P-SL2 – Shore Land within 75 feet of the normal high-water mark
- P-WL1 – Wetlands of special significance (WOSS)
- P-WL2 – Wetlands scrub shrub (PSS)

Approximately one mile south of the 697-acre BT there are approximately 10,000 contiguous acres of Conserved Lands encompassing: Pierce Pond, Grass Pond, Kilgore Pond, Split Rock Pond, Higher Pond, Dixon Pond, Fernald Pond and Horseshoe Pond as well as the Appalachian Trail Corridor. There are no Focus Areas immediately adjacent to or within one mile of BT.

7.5 Wildlife Use

Wildlife usage and habitat evaluations on BT were conducted based on field surveys, aerial photo interpretation of landscape and terrain, and research of IPaC results from the USFWS for endangered species, critical habitat, migratory birds, and fisheries in and around the area. According to the results of the IPaC report (Appendix 7A), two threatened species - Canada lynx (*Lynx canadensis*) and Northern long-eared bat (*Myotis septentrionalis*) - and one endangered species – Atlantic salmon (*Salmo salar*) could be affected by activities on the property.

During field surveys, either evidence of or actual sightings occurred for moose (*Alces alces*), white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), red fox (*Vulpes vulpes*), Eastern gray squirrel (*Sciurus carolinensis*), red squirrel (*Sciurus vulgaris*), woodland jumping mouse (*Napaeozapus insignisand*), chipmunks (*Tamias sp*.) and snowshoe hare (*Lepus americanus*). Based on the location and vegetative cover in the location of P-FW (060030) on the LUPC map (Figure 6.2), an approximately 180-acre Deer Wintering Area is located along the riparian corridor across the center of the Tract and along west boundary which also extends upstream along the Dead River to GFT. Coyote (*Canis latrans*), beaver (*Castor candensis*), mink (*Neovison vison*), river otter (*Lontar canadensis*), fisher (*Pekania pennanti*) and pine marten (*Martes americana)* are furbearers that inhabit or traverse the Tract.

Several bird species were observed and heard on the property including, but not limited to bald eagle (*Haliaeetus leucocephalus*), sharp-shinned hawk (*Accipiter striatus*), common raven (*Corvus corax*), American robin (*Turdus migratorius*), and wood thrush (*Hylocichla mustelina*). The Tract has been logged in upland portions in past years; however, this disturbance allows for opportunistic, successional plant species to colonize such as red raspberry which increases in cut areas and has a positive impact on food sources for many birds and animals

Vernal pools on the property consist of one low value vernal pools, one low value Corps vernal pools and four potential vernal pools. The vernal pool contained spotted salamander (*Ambystoma maculatum*) egg masses at the time of observation (Photo 7.5). The other pools have the potential to harbor wood frog (*Lithobates sylvaticus*) egg masses, but due to survey timing, finding presence of such egg masses was not possible. Garter snakes (*Thamnophis* spp.) American toads (*Anaxyrus americanus*), and green frogs (*Lithobates clamitans*) were also observed during field surveys.

7.6 Vegetation

The property includes a variety of vegetative communities which provide different cover types, habitat characteristics, and ecological function. The property is primarily composed of mature mixed coniferous-deciduous forest. There are also large swaths of scrub-shrub floodplain wetlands along the Dead River and early successional forest close to the southern boundary where there is evidence of historic logging operations.

Uplands and wetlands were identified in the mixed coniferous-deciduous forests. Dominant tree species in the forested uplands include American beech (*Fagus grandifolia*), eastern hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*), red spruce (*Picea rubens*), and red maple (*Acer rubrum*). Common woody plants in the shrub stratum include striped maple (*Acer pennsylvanicum*), mountain maple (*Acer spicatum*), hobblebush (*Viburnum lantanoides*), and beaked hazelnut (*Corylus cornuta*). Common forbs and grasses in the upland forested understory are northern long-awned wood grass (*Brachyelytrum aristosum*), whorled aster (*Oclemena acuminate*), starflower (*Lysimachia borealis*), rosy bells (*Streptopus lanceolatus*), sarsaparilla (*Aralia nudicaulis*), elliptic-leaved shinleaf (*Pyrola elliptica*) and evergreen wood fern (*Dryopteris intermedia*).

Forested wetlands typically occur at the base of the slope on a terraced flat above the riverine floodplain. Dominant tree species in the forested wetland include northern white cedar (*Thuja occidentalis*), yellow birch (*Betula allegheniensis*), balsam fir (*Abies balsamea*) and red maple. Common herbaceous plants in the forested wetland understory (Photo 7.6) include interrupted fern (*Osmunda claytonia*), sensitive fern (*Onoclea sensibilis*), jewelweed (*Impatiens capensis*), bedstraw (*Galium* spp.), fowl manna grass (*Glyceria striata*), and sedges (*Carex* spp.).

The early successional forest around previously logged areas are dominated by gray birch (*Betula populifolia*), quaking aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), opportunistic red raspberry (*Rubus idaeus*) and other early successional species such as fireweed (*Chamerion angustifolium*), drooping sedge (*Carex gynandra*), sweet vernal grass (*Anthoxanthum odoratum*), timothy grass (*Phleum pretense*), bent grass (*Agrostis* spp.), common St. John's wort (*Hypericum perforatum*), vetch (*Vicia* sp.), flat top goldenrod (*Euthamia graminifolia*), and hawkweeds (*Hieracium* spp).

Due to the steep sloping topography of the site, toe of slope seeps and ephemeral drainages occur sporadically throughout the tract, creating microclimatic wetlands that exist in channels (Photo 7.7). Common understory plants found in these habitats include foam flower (*Tiarella cordifolia*), jewelweed, enchanter's nightshade (*Circaea alpine*), sensitive fern, sedges, and buttercups (*Ranunculus* spp.).

The scrub-shrub wetlands occur primarily along the banks of the Dead River and are subject to seasonal flooding linked to dam releases upstream. Dominant shrubs in this habitat are speckled alder (*Alnus incana* ssp. *rugosa*), meadowsweet (*Spiraea alba* var. *latifolia*), and red-osier dogwood (*Swida sericea*). Common herbaceous plants are Canada goldenrod (*Solidago Canadensis*), Kentucky bluegrass (*Poa pratensis*), Virginia virgin's bower (*Clematis virginiana*), northern long-awned wood grass (*Brachyelytrum aristosum*), wrinkle leaved goldenrod (*Solidago rugosa*), tall meadow-rue (*Thalictrum pubescens*), and bedstraw (*Galium* spp.).

7.7 Wetland Characteristics, Functions and Values

Approximately 63.37 acres (9.1%) of the 697 total acres of the BT were identified as palustrine wetland during the field survey effort. The primary wetland system is palustrine forested (PFO4/1) (Photo 7.8), generally located on topographic terraces between the palustrine scrub shrub (PSS) floodplain of the Dead River and the steep slopes on the southern end of the site. The portion of the forested wetland located on the BT totals approximately 48.6 acres. The second most abundant wetland is palustrine scrub shrub, which occupies a total of 14.7 acres of the property (Photo 7.9). The Dead River, a permanently flooded, upper perennial riverine system with an unconsolidated bottom (R3UBH) that flows west to east, is the northern property boundary. Approximately 4.2 river miles of the Dead River frontage occurs on the Tract (Photos 7.1 and 7.2). The section of the Dead that flows along the BT boundary has a moderate velocity with varying classes of whitewater that fluctuate with seasonal high water and upstream dam releases. This creates outstanding recreational opportunities for rafters and kayakers. Approximately 1.5 miles downstream of the northwestern boundary of the Tract, an unnamed stream (R3UBH) flowing south to north through upland forest, joins the Dead River (Photo 7.10). This area has been identified by LUPC as a significant deer wintering habitat.

As mapped by the USDA NRCS on Web Soil Survey, approximately 330 acres (47%), of BT is underlain by very poorly drained (VPD) and somewhat poorly drained (SPD) hydric soils. These areas of hydric soils typically occur on slopes of 0 to 15 percent. Map Unit Name and Symbols for hydric soils at BT include:

- Bucksport and Wonsqueak mucks (WO) – VPD organic soils derived from vegetation deposited in water with 0 to 2 percent slopes.
- Colonel-Peru-Pillsbury (PD) association (CNC) – SPD mineral soils of loamy and coarse loamy textures with 3 to 15 percent slopes.
- Colonel-Pillsbury (PD)-Skerry association (CRB) – SPD mineral soils of loamy and coarse loamy textures with 0 to 8 percent slopes.

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TABLE 7-1 SUMMARY OF FUNCTIONS & VALUES OF WETLANDS ON THE 697.06 ACRE BASIN TRACT

FUNCTION/VALUE	EXPLANATION
Groundwater Recharge/Discharge (GW)	Wetlands on river valley slopes of BT are commonly associated with spring/seeps or sites of groundwater discharge and as part of the surface hydrologic system at other locations on BT are recharge areas to the baseflow of the Dead River (Photo 7.7).
Flood flow Alteration (FF)	Pierce Pond Twp is designated as "no data/No Specific Flood Hazard Area" (Dudley and Schalk 2006), however water levels along the Dead River are actively managed at the Long Falls Dam outlet of Flagstaff Lake by Brookfield Renewable Energy. In relation to these fluctuating water levels, a principal function of wetlands on the Basin Tract that are along and hydrologically connected to the Dead River is Floodflow Alteration.
Fish and Shellfish Habitat (FH)	The Dead River is popular for brook trout and landlocked salmon fishing. Downstream in 2017, the segment of the Dead River crossing T3 R4 BKP WKR where LET is located was stocked with approximately 1,550, 8- to 14-inch landlocked salmon and brook trout to support the fishery for recreational angler (MDIFW 2018). Freshwater mussels were observed on BT along muddy shorelines of the Dead River.
Production Export (PE)	As evidenced by browse, droppings and other sign, woody vegetation in BT wetlands is a fundamental food source for all herbivorous and omnivorous wildlife inhabiting the Tract. Seeds, roots and stems from herbaceous vegetation in not only PEM but PSS and PFO wetlands on BT are also food sources for not only mammals, but the wide variety of birds, amphibians, reptiles, fish and insects that inhabit or traverse the Tract.
Sediment/Toxicant/ Pathogen Retention (STPR)	Micro-topography (Photo 7.5) as well as woody and herbaceous vegetation throughout BT wetlands physically slow surface water transport and retain these degraders of water quality to the Dead River. Sediments/toxicants/pathogens trapped with accumulation of vegetative remains as peat or other forms of hydric soils is another form of BT wetlands protecting water quality of tributary streams and the Dead River.
Nutrient Removal (NR)	Micro-topography as well as woody and herbaceous vegetation throughout BT wetlands slow surface water transport of nutrients protecting the Dead River as well as lesser tributaries from water quality degradation. Direct uptake of nutrients by wetland vegetation and subsequent accumulation of dead vegetation in organic soils and peat is another pathway of BT wetlands protecting water quality.
Sediment/Shoreline Stabilization (SS)	Riverine and palustrine wetlands aligned along the south shore of the Dead River buffer and protect the adjoining upland shoreline from scour and erosion (Photos 7.1 and 7.2).
Wildlife Habitat (WH)	In addition to direct observation as well as tracks, droppings and other sign, moose, bear, deer, coyote, beaver, otter, mink and other smaller mammals are abundant on BT. Based on the location and vegetative cover in the location of P-FW (060030) on the LUPC map (Figure 6.2), a Deer Wintering Area is located along the riparian corridor across the center of the Tract and along west boundary which also extends upstream along the Dead River to GFT.
Educational/ Scientific Value (ED)	Although there appear to be no records of educational use or scientific research attributes of BT including, the baseline of mapped resources and remote location along riparian corridors of Enchanted Stream and the Dead River could be relevant to further study.
Recreation (REC)	Established camps sites occur on BT (Photo 7.3) and the MHT network is on the opposite shore of the Dead River and traveled by day, and through hikers and also used for camping, cross country skiing and snowshoeing. Commercial river rafting on the Dead River passes along the shoreline of the Tract. The Dead River is also regarded for trout and salmon fishing. Hunting opportunities are another recreational value of the Tract and its wetlands.

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7.8 Compensation

As part of the compensation package for NECEC, the approximately 697.06-acre Basin Tract will be permanently protected by a conservation easement or similar instrument. Preservation of BT will permanently protect 4.16 miles of intact and unaltered riparian buffer along the south side of the Dead River that is designated as an Outstanding River Segment (Ch 200 §403). Approximately one mile south of the Tract is more than 10,000 contiguous acres of Conserved Lands that encompass at least eight essentially unaltered or sparsely developed "great ponds." In addition, approximately nine percent (63.37 acres) of the 697.06-acre BT are comprised of a mix of PSS and PFO wetland types.

BT is accessible by Bowtown Road and most of the Tract is zoned M-GN. Development of this otherwise undeveloped Tract could therefore occur. Preservation of GFT would provide permanent protection from development and preserve the existing deer wintering area, wetland based wildlife, vernal pool, fish and shellfish habitats, water quality benefits, and recreational and educational opportunities.

7.9 Photographs

PHOTO 7-1 THE BASIN TRACT HAS APPROXIMATELY 4.2 MILES OF RIVER FRONTAGE ON THE SOUTHERN BANK OF THE DEAD RIVER

PHOTO 7-2 WHITEWATER RAPIDS OF VARYING DIFFICULTY GRADES OCCUR ALONG THE DEAD RIVER JUST NORTH OF THE BASIN TRACT PROPERTY BOUNDARY

PHOTO 7-3 A LOGGING ROAD LEADS FROM THE SOUTHERN PROPERTY BOUNDARY DOWNHILL TO AN ACTIVE CAMPSITE ALONG THE DEAD RIVER

PHOTO 7-4 FIRE PERMITS FROM THE MAINE FOREST SERVICE FOREST ARE REQUIRED AT THE CAMPSITE IN THE PREVIOUS PHOTOGRAPH

PHOTO 7-5 PIT AND MOUND MICRO-RELIEF OF THE FORESTED WETLANDS (PFO) PROVIDE POTENTIAL TOPOGRAPHIC CHARACTERISTICS SUITABLE TO VERNAL POOLS

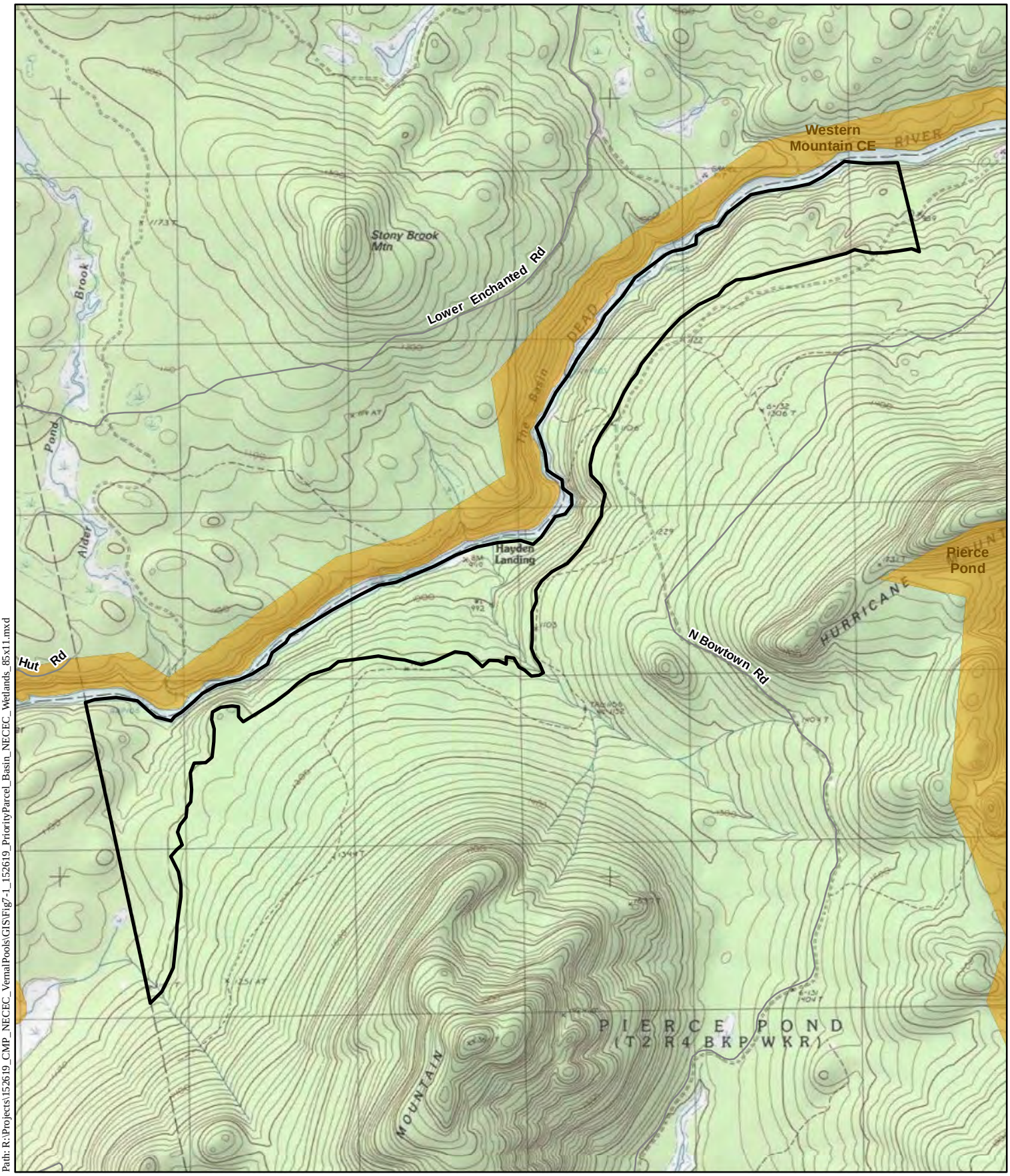
PHOTO 7-6 HYDROPHYTIC GRAMINOIDS ARE COMMON UNDERSTORY PLANTS IN THE FLOODPLAIN FOREST NEAR THE BANKS OF THE DEAD RIVER

PHOTO 7-7 EPHEMERAL CHANNELS CROSSING THE STEEP SLOPES ON THE SOUTHERN EDGE OF THE BASIN TRACT CONVEY DRAINAGE FROM THE LOGGED AREA TO THE DEAD RIVER

PHOTO 7-8 CEDAR AND YELLOW BIRCH FORESTS (PFO1/4), ABUNDANT ON THE BASIN TRACT, ARE OFTEN ASSOCIATED WITH SEEPS HAVING PIT AND MOUND MICRO-TOPOGRAPHY CHARACTERISTIC OF FORESTED WETLANDS

PHOTO 7-9 SCRUB-SHRUB WETLAND (PSS) DOMINATED BY SPECKLED ALDER AVERAGE APPROXIMATELY 30 FEET IN WIDTH ALONG THE DEAD RIVER SHORELINE

PHOTO 7-10 THE RIPARIAN CORRIDOR ALONG THIS PERENNIAL STREAM, LOCATED IN THE CENTER OF THE TRACT, IS IDENTIFIED BY THE LAND USE PLANNING COMMISSION AS PART OF A SIGNIFICANT FISH AND WILDLIFE USAGE AREA (P-FW 060030)



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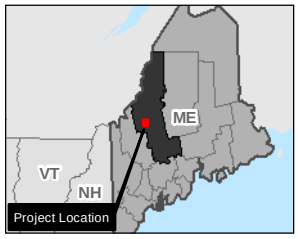

Road

Conserved Lands

Survey Boundary

N
W E
S

SCALE: 1 " = 2,500 '

0 1,250 2,500
Feet

Figure 7.1: Locus
Basin Tract

Somerset County
Maine

Date:8/6/2018
Author: KK
Project: 152619

Central Maine Power

NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

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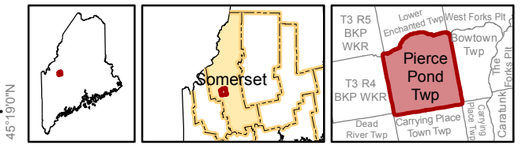
Pierce Pond Twp.

T2 R4 BKP WKR

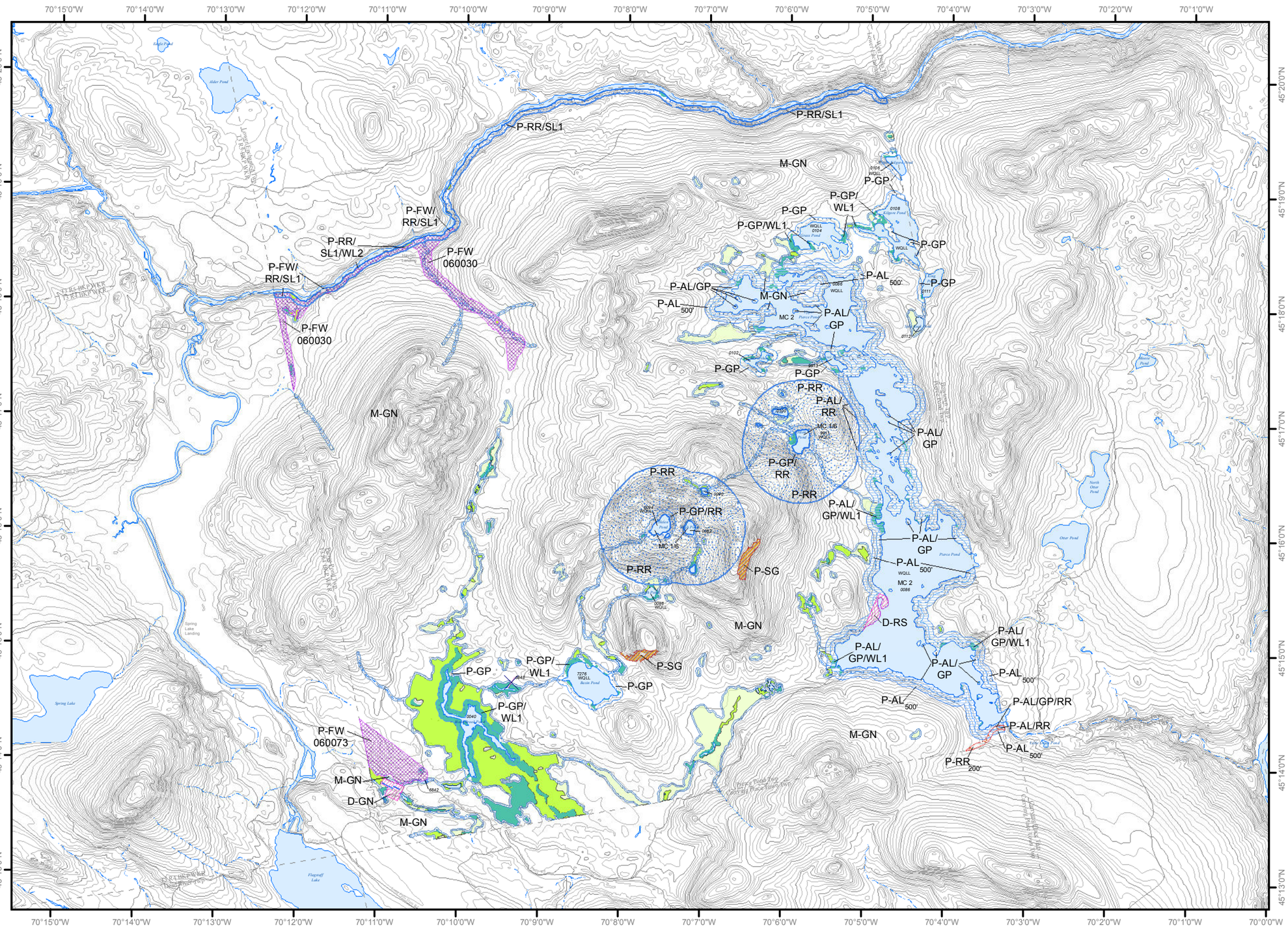
Somerset County



Land Use Guidance Map

Department of Agriculture, Conservation and Forestry

Maine Land Use Planning Commission



Legend

DEVELOPMENT SUBDISTRICTS

- D-GN: General

MANAGEMENT SUBDISTRICTS

- M-GN: General

PROTECTION SUBDISTRICTS

- P-AL: Accessible Lake
- P-FW: Fish and Wildlife
- P-GP: Great Pond
- P-RR200: Recreation - 200'
- P-RR: Recreation
- P-SG: Soils and Geology
- P-SL1: Shoreland - 250'
- P-SL2: Shoreland - 75'
- P-WL1: Wetlands of Special Significance
- P-WL2: Scrub-shrub Wetlands
- P-WL3: Forested Wetlands

This map does not show all designated P-WL Subdistricts, such as non-tidal water bodies and freshwater wetlands within 25 feet of flowing waters.

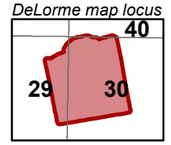
This map is a reducedsize version and should not be considered definitive. Full sized, official Land Use Guidance Maps are available on the LUPC website or by request.

Amendments			
Location #	Zoning Permit	Effective Date	Remarks
		08/18/2005	Adoption of digital NWI wetlands

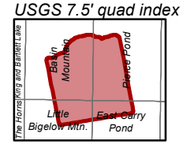
0 1,500 3,000 4,500 6,000 Meters

0 5,200 10,400 15,600 20,800 Feet

DeLorme map locus



USGS 7.5' quad index



(1) Map amendment location

▲ Point at which a river drains 25 square miles - symbol points upstream (12 M.R.S. Sec. 682-B(4))

9999 MIDAS number: Unique number assigned to each standing body of water in Maine.

WQLL Water Quality Limiting Lake - Refer to Section 10.23,E,3,g of the Commission's Land Use Districts and Standards.

MC# Lake Management Classes - Refer to Section 10.02 (Definitions) of the Commission's Land Use Districts and Standards.

SOURCES: Maine Land Use Planning Commission, USGS

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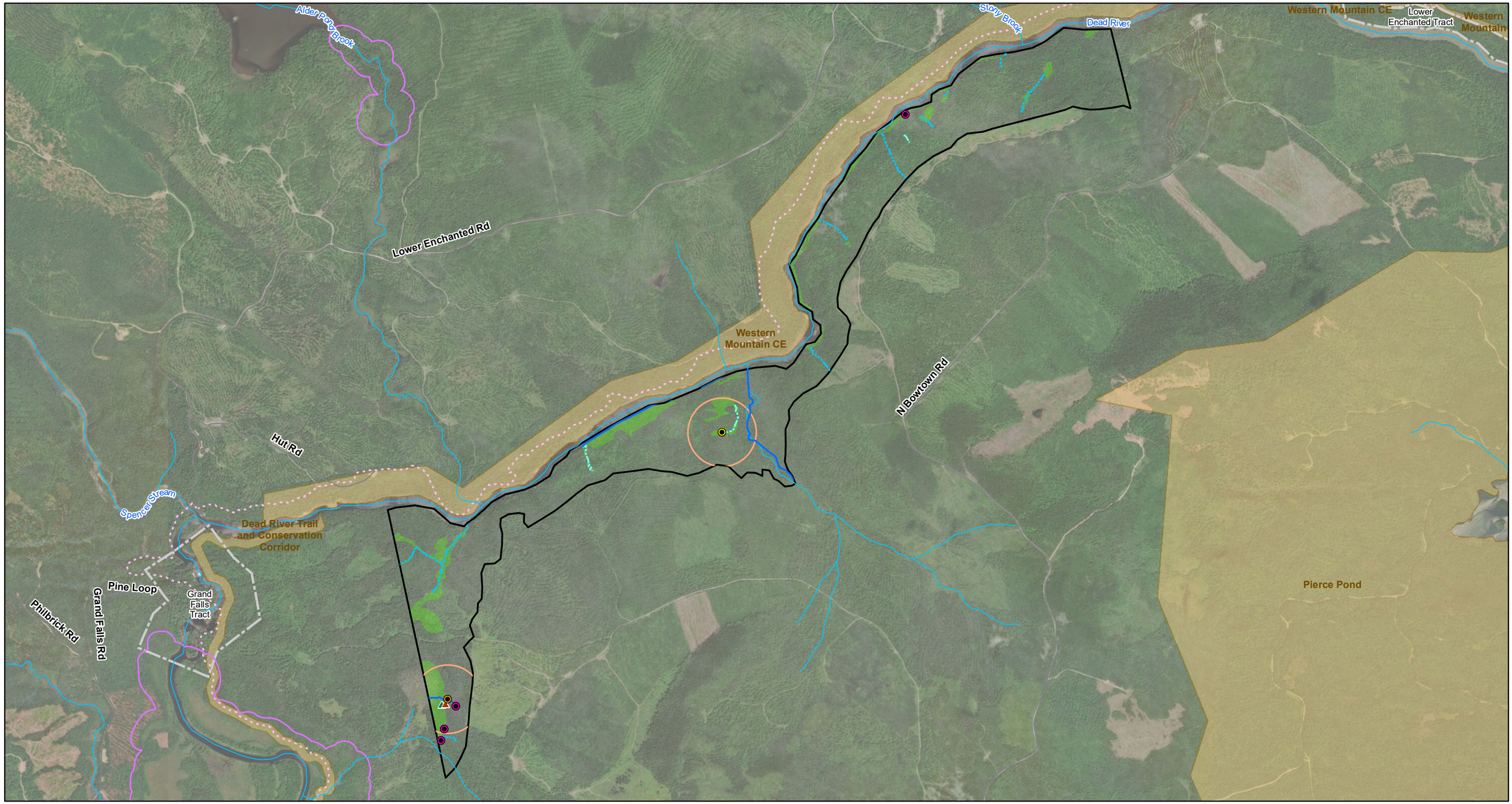
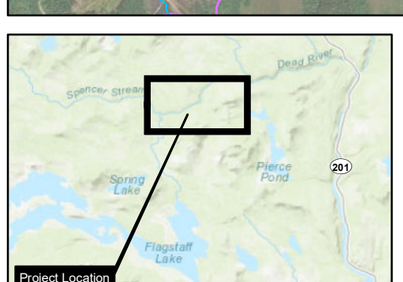
Path: R:\Projects\152619_CMP_NECEC_VernalPools\GIS\Fig7-3_152619_PriorityParcel_Basin_NECEC_Wetlands_11x17L.mxd





- Corps Vernal Pool
- Vernal Pool
- Potential Vernal Pool
- Wetland Data Point
- Upland Data Point
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Stream (NHD)
- Critical Terrestrial Habitat (750')
- Maine Huts & Trails Main Trail
- Road
- Inland Waterfowl and Wading Bird Habitat
- Survey Area
- Other Tract
- Delineated Wetland
- Conservation Land

Figure 7.3: Natural Resources
Basin Tract

Somerset County, Maine

DRAFT

0 1,000 2,000 4,000
Feet

1 " = 2,000 '

Page 1 of 1

Central Maine Power
NECEC Compensation Parcels
Natural Resource Survey Results

CENTRAL MAINE POWER

POWER ENGINEERS

Date: 8/6/2018; Author: KK; Project: 152619

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APPENDIX 7A IPAC RESULTS: BASIN TRACT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Project information

NAME

Compensatory Mitigation

LOCATION

Somerset County, Maine

DESCRIPTION

BT

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 04431

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

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NOT FOR CONSULTATION

Canada Lynx *Lynx canadensis* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

THERE ARE NO MIGRATORY BIRDS OF CONSERVATION CONCERN EXPECTED TO OCCUR AT THIS LOCATION.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

NOT FOR CONSULTATION

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

NOT FOR CONSULTATION

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

PSS1E
PFO4E

RIVERINE

R3UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

NOT FOR CONSULTATION

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

APPENDIX 7B VEGETATION LIST: BASIN TRACT

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Abies balsamea	Balsam Fir	Pinaceae	FAC
Acer pennsylvanicum	Striped Maple	Sapindaceae	FACU
Acer rubrum	Red Maple	Sapindaceae	FAC
Acer spicatum	Mountain Maple	Sapindaceae	FACU
Actaea rubra	Red Baneberry	Ranunculaceae	FACU
Agrostis capillaris	Colonial Bentgrass	Poaceae	FAC
Alnus incana ssp. *rugosa*	Speckled Alder	Betulaceae	FACW
Amelanchier laevis	Smooth Shadbush	Rosaceae	N/A
Anemone quinquefolia	Nightcaps	Ranunculaceae	FACU
Anthoxanthum odoratum	Sweet Vernal Grass	Poaceae	FACU
Apocynum cannabinum	Indian Hemp	Apocynaceae	FAC
Aralia nudicaulis	Wild Sarsaparilla	Araliaceae	FACU
Arctium minus	Common Burdock	Asteraceae	FACU
Arisaema triphyllum	Jack-in-the-Pulpit	Araceae	FAC
Betula alleghaniensis	Yellow Birch	Betulaceae	FAC
Betula payrifera	Paper Birch	Betulaceae	FACU
Betula populifolia	Gray Birch	Betulaceae	FAC
Brachyelytrum aristosum	Northern Long-Awned Wood Grass	Poaceae	FACU
Campanula rotundifolia	Scotch Bellflower	Campanulaceae	FACU
Carex cryptolepis	Northeastern Sedge	Cyperaceae	OBL
Carex debilis	White-Edged Sedge	Cyperaceae	FACW
Carex disperma	Soft-Leaf Sedge	Cyperaceae	FACW
Carex gracillima	Graceful Sedge	Cyperaceae	FACU
Carex gynandra	Nodding Sedge	Cyperaceae	OBL
Carex intumescens	Greater Bladder Sedge	Cyperaceae	FACW
Carex stipata	Stalk-Grain Sedge	Cyperaceae	OBL
Chamaepericlymenum canadense	Bunchberry	Cornaceae	FAC
Chamerion angustifolium	Narrow-Leaved Fireweed	Onagraceae	N/A
Circaea alpina	Small Enchanter's Nightshade	Onagraceae	FACW
Clematis virginiana	Virginia Virgin's Bower	Ranunculaceae	FAC
Clintonia borealis	Yellow Bluebead Lily	Liliaceae	FAC
Coptis trifolia	Three-Leaf Goldthread	Ranunculaceae	FACW
Corylus cornuta	Beaked Hazelnut	Betulaceae	FACU
Crataegus sp.	Hawthorne	Rosaceae	N/A
Diervilla lonicera	Bush-Honeysuckle	Caprifoliaceae	N/A
Dryopteris intermedia	Evergreen Wood Fern	Dryopteridaceae	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Epipactis helleborine	Broad-Leaved Helleborine	Orchidaceae	UPL
Equisetum arvense	Field Horsetail	Equisetaceae	FAC
Equisetum scirpoides	Dwarf Scouring Rush	Equisetaceae	FAC
Equisetum sylvaticum	Woodland Horsetail	Equisetaceae	FACW
Euthamia graminifolia	Flat-Top Goldentop	Asteraceae	FAC
Fragaria virginiana	Common Strawberry	Rosaceae	FACU
Fraxinus americana	White Ash	Oleaceae	FACU
Fraxinus nigra	Black Ash	Oleaceae	FACW
Galium aparine	Scratch Bedstraw	Rubiaceae	FACU
Galium odoratum	Sweet-Scented Bedstraw	Rubiaceae	N/A
Galium triflorum	Fragrant Bedstraw	Rubiaceae	FACU
Gaultheria hispidula	Creeping Snowberry	Ericaceae	FACW
Glyceria striata	Fowl Manna Grass	Poaceae	OBL
Gymnocarpium dryopteris	Northern Oak Fern	Woodsiaceae	FACU
Hieracium aurantiacum	Orange Hawkweed	Asteraceae	N/A
Hypericum perforatum	Common St. John's Wort	Hypericaceae	FACW
Impatiens capensis	Spotted Touch-Me-Not	Balsaminaceae	FACW
Lonicera canadensis	American Fly-Honeysuckle	Caprifoliaceae	FACU
Lysimachia borealis	Starflower	Myrsinaceae	N/A
Lysimachia terrestris	Swamp Candles	Myrsinaceae	OBL
Matteuccia struthiopteris	Ostrich Fern	Onocleaceae	FAC
Medeola virginiana	Indian Cucumber Root	Liliaceae	FACU
Mitchella repens	Partridge Berry	Rubiaceae	FACU
Oclemena acuminata	Whorled Aster	Asteraceae	FACU
Onoclea sensibilis	Sensitive Fern	Onocleaceae	FACW
Osmunda claytonia	Interrupted Fern	Osmundaceae	FAC
Osmunda regalis	Royal Fern	Osmundaceae	OBL
Osmundastrum cinnamomeum	Cinnamon Fern	Osmundaceae	FACW
Oxalis montana	Northern Wood Sorrel	Oxalidaceae	FACU
Parathelypteris novaborecensis	New York Fern	Thelypteridaceae	FAC
Phegopteris connectilis	Long Beech Fern	Thelypteridaceae	FACU
Phleum pratense	Common Timothy	Poaceae	FACU
Picea rubens	Red Spruce	Pinaceae	FACU
Plantanthera aquilonis	North Wind Bog-Orchid	Orchidaceae	FACW
Poa pratensis ssp. *pratensis*	Kentucky Blue Grass	Poaceae	FACU
Populus balsamifera	Balsam Poplar	Salicaceae	FACW
Populus tremuloides	Quaking Aspen	Salicaceae	FACU
Prunella vulgaris	Common Self-Heal	Lamiaceae	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	WETLAND PLANT INDICATOR RATING [1, 2]
Prunus nigra	Canada Plum	Rosaceae	FACU
Pyrola elliptica	Elliptic-Leaved Shinleaf	Ericaceae	FACU
Ranunculus spp.	Crowfoot	Ranunculaceae	N/A
Ribes glandulosum	Skunk Currant	Grossulariaceae	FACW
Ribes lacustre	Bristly Swamp Currant	Grossulariaceae	FACW
Rosa blanda	Smooth Rose	Rosaceae	FACU
Rubus hispidus	Bristly Dewberry	Rosaceae	FACW
Rubus idaeus	Red Raspberry	Rosaceae	FACU
Sambucus racemosa ssp. *pubens*	Red Elderberry	Adoxaceae	FACU
Sanicula marilandica	Maryland Sanicle	Apiaceaea	FACU
Scutellaria lateriflora	Mad Dog Skullcap	Lamiaceae	OBL
Solidago canadensis	Canadian Goldenrod	Asteraceae	FACU
Solidago rugosa	Wrinkle-Leaf Goldenrod	Asteraceae	FACU
Sorbus americana	American Mountain Ash	Rosaceae	FAC
Spinulum annotinum	Bristly Clubmoss	Lycopodiaceae	FAC
Streptopus lanceolatus	Rosy Bells	Liliaceae	FACU
Swida alternifolia	Alternate-Leaved Dogwood	Cornaceae	FACU
Swida sericea	Red Osier Dogwood	Cornaceae	FACW
Symphyotrichum lateriflorum	Calico American Aster	Asteraceae	FAC
Thalictrum pubescens	Tall Meadow-Rue	Ranunculaceae	FACW
Thuja occidentalis	Northern White Cedar	Cupressaceae	FACW
Trillium erectum	Stinking Benjamin	Melanthiaceae	FACU
Trillium undulatum	Painted Trillium	Melanthiaceae	FACU
Tsuga canadensis	Eastern Hemlock	Pinaceae	FACU
Vaccinium angustifolium	Common Lowbush Blueberry	Ericaceae	FACU
Viburnum lantanoides	Hobblebush	Adoxaceae	FACU
Viola spp.	Violets	Violaceae	N/A
INDICATOR STATUS	OCCURRENCE IN WETLANDS (% per Reed, 1998)		
Obligate (OBL)	Almost always occurs in wetlands under natural conditions (99%)		
Facultative Wetland (FACW)	Usually in wetlands, occasionally found in non-wetlands (67- 99%)		
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands. (33-67%)		
Facultative Upland (FACU)	Usually in non-wetlands, occasionally found in wetlands (1-33%)		
Upland (UPL)	Almost always in non-wetlands under natural conditions (1%)		

[1] Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. USACE National Wetland Plant List. Web.20 June 2018.
[2] Lichvar, R.W., N.C. Melvin, M.L. Butterwick, and W.N. Kirchner. 2012. National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TN-12-1, USACE Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at https://www.fws.gov/wetlands/documents/national-wetland-plant-list-indicator-rating-definitions.pdf [Verified 20 June 2018].

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8.0 SUMMARY AND CONCLUSIONS

8.1 Potential Compensation Tracts Summary

The extent and composition of the surveyed natural resources on the six potential compensation tracts displayed on Figures 2.2 (LJPT), 3.3 (FLT), 4.3 (PPT), 5.3 (GFT) 6.3 (LET) and 7.3 (BT) are summarized in Table 8.1.

TABLE 8-1 NECEC POTENTIAL COMPENSATION TRACTS NATURAL RESOURCE SUMMARY

WETLAND TYPE (acres)	LJPT	FLT	PPT	GFT	LET	BT
PUB	-	-	8.40	-	-	-
PEM	50.11	16.48	3.13	0.46	-	-
PSS	-	94.71	4.80	2.97	8.18	14.72
PFO	18.36	312.77	2.00	11.08	4.79	48.65
Total Palustrine Wetland Area (acres)	68.46	423.96	18.33	14.51	12.97	63.37
Total Palustrine Wetland Percentage of Tract (%)	62.37	50.99	22.56	12.00	5.46	9.09
R2 (river-miles)	0.12	1.52	0.78	1.11	-	-
R3 (river-miles)	-	-	-	0.45	5.13	4.21
R4 (river-miles)	-	0.52	-	-	-	-
Total Riverine Frontage (miles)	0.12	2.04	0.78	1.56	5.13	4.21
R2 (acres)	-	-	-	14.92	-	-
R3 (acres)	-	-	-	3.74	6.67	-
Total Riverine Area (acres)	N/A	N/A	N/A	18.66	6.67	N/A
Total Riverine Wetland Percentage of Tract (%)	N/A	N/A	N/A	15.44	10.24	N/A
L1UB (miles)	-	8.50	-	-	-	-
Total Lacustrine Frontage (miles)	N/A	8.50	N/A	N/A	N/A	N/A
Total Lacustrine Frontage and Wetland Percentage of Tract (%)	62.73	50.99	22.56	27.44	15.70	9.90

Additional information describing the surveyed natural resources on the six Compensation Tracts displayed on Figures 2.2 (LJPT), 3.3 (FLT), 4.3 (PPT), 5.3 (GFT) 6.3 (LET) and 7.3 (BT) is presented in Table 8.2.

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TABLE 8-2 NECEC POTENTIAL COMPENSATION TRACTS SUMMARY

	PHYSICAL ATTRIBUTES	WETLAND CLASSIFICATION	FUNCTIONS AND VALUES	SWH / JUXTAPOSITION	DEVELOPMENT
Little Jimmie Pond –Harwood (LJPT) 109.77 Acres	Wetlands: 68.46 acres Streams: 3,030 feet (ft) (0.58 miles [mi]) Frontage: 0.17 mi Hutchinson Pond	NWI: L1UB, PFO4/1, PSS, PEM WOSS: SWH (moderate value IWWH), GP250, FP, PT, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, ED, REC	SWH: 211.5-acre medium ranked IWWH, candidate DWA, 2 PSVPs Conserved Land: 886-acre Jamie's Pond WMA, 81-acre Hutchinson Pond (KLT)	Zoning: Rural/Residential (R1) – 2.0-acre Shoreland Zone Resource Protection Aquifer Overlay
Flagstaff Lake (FLT) 831.39 Acres (76.31 Acres Leased)	Wetlands: 423.96 acres Streams: 10,790 ft (2.04 mi) Frontage: 8.5 miles Flagstaff Lake	NWI: L1UB, PFO1/4 PSS, PEM, PUB WOSS: SWH (high value IWWH), GP 250, 20k POW/PEM, FP, PT, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, ED, REC	SWH: 36.5-acre high value IWWH, 1 PSVP Conserved Land: Bigelow Preserve, Dead River Peninsula, Dead River Trail & Conservation Corridor, Appalachian Trail Corridor	Zoning: M-GN P-AL, P-GP, P-SL2 P-WL1, P-WL2, P-WL3
Pooler Ponds (PPT) 81.24 Acres	Wetlands: 18.33 acres Streams: 4,480 ft (0.85 mi) Frontage: 0.8 mi Kennebec River	NWI: R2UB, PFO1/4, PSS, PEM, PUB WOSS: SWH (moderate value IWWH), GP 250, 20k POW/PEM, FP, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, ED, REC	SWH: 31.39 moderate value IWWH Conserved Land: none within 1.0 mile Appalachian Trail Corridor 3.4 miles to south	Zoning: M-GN P-GP, P-SL1, P-SL2, P-WL1, WQLL
Grand Falls (GFT) 120.84 Acres (< 1 acre leased)	Wetlands: 14.51 acres Streams: 5,610 ft (1.06 mi) Frontage: 0.7 mi Dead River	NWI: R3UB, PFO1/4, PSS, PEM WOSS: SWH (moderate value IWWH), 20k POW/PEM, FP, PT, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, ED, REC	SWH: 16.01 acres of 1,542-acre moderate value IWWH, DWA (LUPC): 1 SVP, 1 PSVP Conserved Land: Dead River Trail & Conservation Corridor	Zoning: M-GN P-FP, P-FW 0600300 P-RR, P-SL1, P-UA P-WL1, P-WL2, P-WL3

	PHYSICAL ATTRIBUTES	WETLAND CLASSIFICATION	FUNCTIONS AND VALUES	SWH / JUXTAPOSITION	DEVELOPMENT
Lower Enchanted (LET) 235.60 Acres	Wetlands: 12.97 acres Streams: 22,620 ft (4.28 mi) Frontage: 2.3 mi Dead River 1.33 mi Enchanted Stream	NWI: R3UB, PFO1/4, PSS WOSS: FP, PT, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, REC	SWH: w/in 150 ft of 276-acre moderate value IWWH, 1 PSVP Conserved Land: Western Mountain Charitable Foundation Easement	Zoning: M-GN P-RR, P-SL1, P-SL2 P-WL2, P-WL3
Basin (BT) 697.06 Acres	Wetlands: 63.37 acres Streams: 35,210 ft (6.67 mi) Frontage: 4.2 mi Dead River	NWI: R3UB, PFO1/4, PSS, PEM WOSS: FP, PT, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, REC	SWH: DWA (LUPC) Conserved Land: 10,000+ contiguous acres one mile to the south	Zoning: M-GN P-FW 060030, P-RR PSL-1, P-SL2 P-WL1, P-WL2
SUMMARY: 2,075.90 ACRES	Wetlands: 601.6 acres Streams: 81,740 ft (15.48 mi) Frontage: 8.0 mi Rivers 8.67 mile Lakes	NWI: L1UB, R2UB, R3UB, PFO1/4, PSS, PEM, PUB WOSS: SWH (M/H value IWWH, SVP), GP 250, 20k POW/PEM, FP, PT, RSB	Principal: GW, FF, WH, FH, PE, STPR, NR, SS, ED, REC	SWH: 211.54 acres moderate / high value IWWH, 1 SVP, 5 PSVPs Contiguous Conserved Land: > 41,600 acres	Zoning: All 6 Tracts suitable for residential development

Code explanations can be found at: NWI – page 7; WOSS – page 8; Functions & Values – pages 11-12; SWH/IWWH – page 8; Vernal Pools – pages 8-10; Development – page 124.

8.2 Developability of LUPC Compensation Tracts

LJPT located in Manchester, is therefore subject to the Town of Manchester local zoning and development requirements. A brief, preliminary overview of potential developability requirement for LJPT is presented in related Section 2.5 on page 15.

Similar zoning and development requirements are identified on Land Use Guidance Maps. by the Maine Land Use Planning Commission for the remaining five Tracts and displayed as Figures 4.2, 5.2, 6.2 and 7.2 for FLT, PPT, GFT, LET and BT, respectively. Land Use Subdistricts for each of the five Compensation Tracts are listed under Development on Table 8.1. Portions of all five Tracts are identified as General Management (**M-GN**) Subdistricts as well as the following Protection Subdistricts:

- Shoreland Protection (**P-SL**)
    - **P-SL1 –** areas within 250 feet of the normal high-water mark of flowing waters upstream of a 50-square mile drainage area.
    - **P-SL2 –** areas within 75 feet of the normal high-water mark of flowing waters downstream of a 50-square mile drainage area, and the upland edge of freshwater wetlands designated as P-WL1, P-WL2 and P-WL3.
- Wetland Protection (**P-WL**), obtained from NWI maps prepared by the USFWS (Nichols 1984; Tiner 2007), is comprised of:
    - **P-WL1 –** wetlands of special significance (WOSS),
    - **P-WL2 –** scrub shrub and other non-forested wetlands, or
    - **P-WL3 –** forested wetlands (excluding those covered under PWL-1, PWL-2).

The following additional Protection Subdistricts are also present on four specific Tracts:

- Accessible Lake (**P-AL**) - FLT
- Flood Prone areas (**P-FP**) – GFT,
- Fish and Wildlife (**P-FW**) – GFT, BT
- Great Pond (**P-GP**) – FLT, PPT
- Unusual Area (**P-UA**) – FLT, GFT

In accordance with MLUPC's Chapter 10, Sub-Chapter II provisions, various land uses in General Management Districts (**M-GN**) are:

1. permissible without a permit, such as (but not limited to) – primitive recreational uses such as fishing, hiking, and wildlife study, forest management activities
2. permissible without a permit subject to standards, including (but not limited to) – Level A road projects, accessory structures; or are
3. specific uses requiring a permit ranging from residential construction (single to multi-family dwellings, and subdivisions to shoreland alterations.

8.3 Potential Compensation Tracts Suitability for the NECEC Project Impacts

As described in greater detail in Section 2.0, Alternatives Analysis, and Section 13.0, Compensatory Mitigation, of the September 27, 2017 NRPA application, the 146.5-mile long NECEC Project Preferred Alternative (Figure 1) will include and require:

- 53.5 miles of undeveloped ROW
- 1,823 acres of clearing, of which 149.07 acres will result in permanent cover type conversion of forested wetland
- 115 stream crossings
- 47.21 acres of temporary (in place less than 18 months. i.e., crane mats) wetland fill
- 0.85 acres of fill in WOSS (includes fill in IWWH and SVPH)
- 4.47 acres of permanent wetland (non-WOSS) fill
- 0.01 acre of permanent upland fill into IWWH
- 31.31 acres permanent upland cover type conversion of SVPH
- 13.31 acres permanent upland cover type conversion of IWWH
- 0.72 acre of permanent upland fill in SVP habitat
- 4.7 acres in or within 100 ft of 250 USACE compensable vernal pools with 56 of high value, 122 medium value, and 72 low value

The Pooler Ponds, Little Jimmie Pond, Grand Falls, Lower Enchanted, Basin and Flagstaff Lake Compensation Tracts (Figure 1), range in size between 81.24 and 831.39 acres, for an aggregate area of 2,075.90 acres and encompass:

- 8.5 miles along the east shore of Flagstaff Lake (Focus Area of Statewide Ecological Significance)
- 1.33 miles of intact, unaltered riparian corridor along each side of Enchanted Stream
- 7.2 miles of intact, unaltered riparian corridor along the Dead River
- 7.16 miles of Outstanding River Segments of the Dead River, encompassing both sides on GFT (Ch 200 §403)
- Grand Falls, the largest horseshoe waterfalls in Maine
- 0.78 mile of intact riparian habitat along the Kennebec River
- 6.15 miles of ephemeral, intermittent and perennial streams (excluding Enchanted Stream and Dead and Kennebec Rivers)
- 601.6 acres of palustrine wetlands (PFO, PSS, PEM, PUB) that provide a suite of principal functions and values including: Groundwater Recharge/Discharge, Floodflow Alteration, Fisheries and Shellfish Habitat, Sediment/Toxicant/Pathogen, Nutrient Removal/Retention, Production (Nutrient) Export, Sediment/Shoreline Stabilization and Wildlife Habitat and Recreation, Educational and Scientific values

- 120.16 acres of moderate or high value IWWH
- At least one high value SVP, four high value PSVPs, 11 medium value, seven low value VPs, 10 medium to low value CVPs, and at least 43 PVP/ABAs
- Associated 516.33 acres of Vernal Pool Critical Terrestrial Habitat (750 feet)
- 220 acres of Deer Wintering Area
- Direct connectivity with more than 41,600 acres of presently permanently-conserved public lands

The relationship of these attributes to the New England District Compensatory Mitigation Guidance discussed in Section 2.1 is summarized in Table 8.3

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TABLE 8-3 USACE NEW ENGLAND DISTRICT COMPENSATORY GUIDANCE (9/1/2016)

(See Section 1.2 on page 5)	LJPT 109.77 acres	FLT 831.39 acres	PPT 81.24 acres	GFT 120.84 acres	LET 235.60 acres	BT 697.0 acres
MITIGATION SITE SELECTION						
Ecologic Suitability:						
hydrologic conditions, soil characteristics and other physical and chemical characteristics,	✓	✓	✓	✓	✓	✓
watershed–scale features such as habitat diversity, connectivity and other landscape scale functions,	Figure 2.3	Figure3.3	Figure 4.3	Figure 5.3	Figure 6.3	Figure 7.3
size and location relative to hydrologic sources and other ecologic features,	Figure 2.1	Figure3.1	Figure 4.1	Figure 5.1	Figure 6.1	Figure 7.1
compatibility with adjacent land use and watershed management	Figure 2.3	Figure3.3	Figure 4.3	Figure 5.3	Figure 6.3	Figure 7.3
reasonably foreseeable effects on ecologically important aquatic or terrestrial resources,	Table 2.1	Table 3.1	Table 4.1	Table 5.1	Table 6.1	Table 7.1
other relevant factors such as: development trends, anticipated land use changes, habitat status and trends, location in stream network, local or regional goals for protection of particular habitat, and water quality and floodplain management goals;	886-acre Jamies Pond WMA, Cobbossee-Annabessacook Focus Area	50,000-acre Bigelow Mtn Flagstaff Lk N Branch Dead River Focus Area	Mod. value IWWH	Outstanding River Segment, Mod value IWWH, DWA	Outstanding River Segment, MHTs	Outstanding River Segment, DWA
Landscape Position (similar setting and wetland types as of the impacted aquatic resource(s)	Figure 2.1	Figure3.1	Figure 4.1	Figure 5.1	Figure 6.1	Figure 7.1
Resistance to Disturbance (located near refuges, buffers, green spaces and other preserved natural elements of the landscape)	Figure 2.1	Figure3.1	Figure 4.1	Figure 5.1	Figure 6.1	Figure 7.1
Sustainability Considerations (current and future hydrology and preference for locations in areas that will remain as open space not to be severely impacted by clearly predictable development)	Figure 2.1 Figure 2.3 Figure 2.3	Figure3.1 Figure 3.2 Figure 3.3	Figure 4.1 Figure 4.2 Figure 4.3	Figure 5.1 Figure 5.2 Figure 5.3	Figure 6.1 Figure 6.2 Figure 6.3	Figure 7.1 Figure 7.2 Figure 7.3
Surrounding land use/plans, including probable future land use	Figure 2.2	Figure3.2	Figure 4.2	Figure 5.2	Figure 6.2	Figure 7.2
FOR PRESERVATION AS COMPENSATORY MITIGATION IN PARTICULAR:						
Resources to be preserved provide important physical, chemical or biological function for the watershed;	Table 2.1	Table 3.1	Table 4.1	Table 5.1	Table 6.1	Table 7.1
Resources to be preserved contribute to the ecological sustainability of the watershed;	HUC 01030003	HUC 01030000	HUC 01030003	HUC 0103002	HUC 01030002	HUC 01030002
Resources are under threat of destruction or adverse modifications;	R-1	M-GN	M-GN	M-GN	M-GN	M-GN
Site will be permanently protected through an appropriate real estate or other legal instrument	✓	✓	✓	✓	✓	✓

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Exhibit 9-10: Title, Right or Interest for the NECEC Preservation Tracts

Exhibit 9-10: Title, Right or Interest for the NECEC Preservation Tracts

Parcel	Town	County	Grantor	Book/Page	Date
Pooler Pond	The Forks	Somerset	Joseph Durgin	631-384	11-18-1960
“	“	“	Herbert Durgin	387-295	6-14-1926
“	“	“	Augusta Trust	391-291	4-1-1927
Little Jimmie Pond	Manchester	Kennebec	Julian Harwood	10775-49	7-1-2011
“	“	“	Herbert Rollins	11147-275	8-24-2012
“	“	“	Julian Harwood et al.	10488-209	7-30-2010
Grand Falls	Spring Lake	Somerset	Edna Page Bunker	396-127	6-30-1927
“	“	“	Albert Clark et al.	397-483	5-19-1928
“	“	“	Charles Clark	396-129	6-24-1927
“	“	“	Ethel Clark	394-555	11-8-1927
“	“	“	Ethel Clark	397-145	11-8-1927
“	“	“	Ethel Clark	401-61	9-29-1928
“	“	“	Wilkie Clark	387-529	9-3-1926
“	“	“	Blinn Page	389-564	2-8-1927
“	“	“	Blinn Page et al.	397-492	5-19-1928
“	“	“	Nellie Toune et al.	396-128	6-24-1927
“	“	“	Blain Viles	387-437	8-5-1926
“	“	“	Helen Wentworth	396-133	7-19-1927
Flagstaff Lake	Dead River Plt. Carrying Place	“	Guy P. Gannet	453-431	1-24-1941
“	“	“	First National Granite Bank	457-457	11-27-1940
“	“	“	Fidelity Trust Company	480-397	3-29-1945
“	“	“	Augusta Trust Company	480-265	2-1-1945
Lower Enchanted	Lower Enchanted	“	Oxford Paper Company	2165-339	12-22-1995
“	“	“	Willie Snow	373-250	5-3-1923
Basin Tract	Pierce Pond	“	Kennebec Land Company	413-221	6-17-1931
“	“	“	Augusta Trust Company	418-131	1-27-1933
The Forks 8/11	The Forks	“	Joseph Durgin	820-865	7-6-1972
“	“	“	Lyford Bean	389-201	5/25/1926
”	“	“	Joseph Durgin	820-865	7/6/1972
”	“	“	Thought to be E. Durgin	-	-
The Forks 11/2	The Forks	“	William and Oscar Jones	380-510	11/1/1923

Parcel	Town	“	Grantor	Book/Page	Date
The Forks 11/9	The Forks	“	Susie Goodwin	536-177	6/14/1951
”	“	“	Alice Kennedy	539-449	12/27/1951
”	“	“	Glenice Merrill	541-538	9/29/1952
Carry Brook	Moxie Gore	“	T-M Corporation	1921-327	8/25/1993
Moxie Stream Lower	Moxie Gore	“	Bessemer Securities Corporation	536-131	5/15/1951
”	“	“	Park, Edward C (Executor of Henry Harriman)	536-138	5/18/1951
”	“	“	Realty Operators Corporation	536-135	5/14/1951
”	“	“	Harriman, Gordon D.	536-141	5/16/1951
Squaretown	Squaretown	“	J.M. Huber Corporation	1932-248	5/31/1993
”	“	“	J.M. Huber Corporation	539-99	10/10/1931
”	“	“	Wyman, W.S., et al	434-89	9/19/1935
Indian Stream	Indian Stream	“	J.M Huber Corporation	1932-248	5/31/1993
”	“	“	J.M. Huber Corporation	539-99	10/10/1931
”	“	“	Wyman, W.S. et al	434-89	9/19/1935

Exhibit 9-11: NECEC Culvert Replacement Program

New England Clean Energy Connect (NECEC) Project
Culvert Replacement Program
October 19, 2018

Introduction

As a component of the NECEC Compensation Plan (submitted August 2018), Central Maine Power Company (CMP) committed to developing a program to address missing, non-functional, damaged, undersized, and improperly installed culverts as mitigation for indirect impacts to coldwater fisheries. The following plan outlines a three-tiered approach to improve habitat connectivity in coldwater fisheries within the project area.

Background

The Maine Department of Environmental Protection (MDEP) and Maine Department of Inland Fisheries and Wildlife (MDIFW) have determined, through review of the NECEC Site Location of Development Law and Natural Resources Protection Act applications, that construction, maintenance, and operation of the project will have unavoidable impacts to coldwater fisheries in the project area, and are requiring CMP to provide mitigation for these impacts. Specifically, MDEP in its General Questions on CMP's application dated December 11, 2017 stated:

> *"the project crosses 67 rivers, streams, or brooks which contain brook trout habitat and five Outstanding River Segments and according to the vegetation management plan all vegetation over ten feet tall will be removed. While the Department has not yet made a determination whether the impacts to these resources are unreasonable there will certainly be impacts to these resources. Please provide a mitigation package to compensate for these impacts."*

Additionally, the MDIFW in its March 15, 2018 environmental review comments on CMP's application noted that the construction of the NECEC has "drastically minimized the amount of linear impact to streams" by utilizing existing logging roads. Should the need arise for modification or replacement of the logging roads or associated culverts, MDIFW makes the following recommendations:

> *"that culverts be replaced with appropriately-sized structures that will restore lost stream connectivity and significantly enhance life history requirements in these streams. MDIFW recommends that any new, modified, and replacement stream crossings, including temporary crossings, be sized to span 1.2 times the bankfull width of the stream. In addition, we recommend that stream crossings be open bottomed (i.e. natural bottom). Any proposed permanent replacement structures should be reviewed and approved by MDIFW fisheries staff prior to installation."*

The MDEP, during an April 3, 2018 compensation working session with CMP and the U.S. Army Corps of Engineers (USACE), informed CMP that in addition to CMP's proposal to make a contribution to the Maine In-Lieu Fee (ILF) Program, land preservation and/or habitat enhancement must also be considered as part of the mitigation package to address all project related impacts. As a result, CMP's compensation plan submitted on August 14, 2018, included a multifaceted proposal consisting of: 1) a contribution to the ILF Program, 2) three compensation tracts, totaling 1,022.4 acres, to offset impacts to wetlands and Inland Wading Bird and Waterfowl habitat (IWWH), 3) three preservation tracts, totaling 1,053.5 acres, to augment existing conserved lands, protect habitat connectivity, and protect 8.1 miles of frontage on the Dead River, to preserve recreational interests associated with Outstanding River segments, 4) habitat mitigation and enhancement proposals for streams containing Roaring Brook Mayfly and Northern Spring Salamander, 5) habitat enhancement for deer wintering areas (DWA) by revegetating disturbed upland areas with a Wildlife Seed Mix, 6) proposed habitat enhancement for indirect impact to coldwater

fisheries in the form of wood addition or "chop and drop" (no longer being considered due to MDIFW guidance), and 7) culvert replacements.

On the recommendation of environmental advocacy groups, CMP turned its attention to the Maine Aquatic Connectivity Restoration Project (MACRP). The MACRP focuses Natural Resources Conservation Service (NRCS) and partner resources to target and improve aquatic organism passage issues in the State of Maine. Through this effort the MACRP partnership developed a geographic information systems (GIS) application named the Maine Stream Habitat Viewer which includes an extensive inventory of culverts throughout the state and their status as it relates to aquatic passage, i.e., no barrier, potential barrier, barrier, unknown. CMP intends to use this application to identify culverts whose replacement would have the most beneficial impact by removal of barriers and improved habitat connectivity on its lands (e.g. within transmission line corridors) and along unimproved project access roads (e.g. off-corridor logging roads) to be used by CMP construction contractors to access the transmission line corridor during construction.

Mitigation

CMP will contact MACRP and request GIS data of culvert locations that have been deemed as barriers or potential barriers to fish passage. CMP will evaluate this information and determine the number and locations of culverts that would be potential candidates for replacement on unimproved roads that will be used during the construction of the NECEC. Priority will be given to culverts that act as barriers to fish passage and that provide habitat connectivity to large stream networks with dendritic watersheds. Only culverts with ½ mile or more of quality upstream stream habitat will be considered. Culverts will be assessed both on CMP controlled lands and on lands that provide off corridor access to the Project. In instances where debris is the sole barrier, i.e., clogging, CMP will simply remove the debris and dispose of it properly. CMP will secure landowner permission for replacements of culverts on private properties prior to performing any work, including surveys to establish existing conditions.

CMP will develop a field variance process, in cooperation with the MDEP and USACE and similar to the process implemented during the 2010 to 2015 construction of the Maine Power Reliability Program (MPRP), to allow for informal review and approval of minor modifications during Project construction. These field variances would then be packaged and included for formal approval through a future permit revision request. Culvert replacements would be consolidated into batches and submitted as a field variance request for review and approval prior to implementation.

Culvert Replacements on CMP Controlled Lands

CMP will replace or remove all culverts that are deemed to be barriers to fish passage on CMP controlled lands associated with the NECEC. This includes the transmission line corridors, mitigation parcels, and access easements held by CMP. CMP will evaluate the condition of all culverts within the Project right-of-way during pre-construction walkovers with the contractor(s), CMP environmental inspector, construction inspector, and MDEP third-party inspector. Culverts identified to be a barrier to fish passage will be documented, flagged with a distinctive color, and GPS located. All parties present on the pre-construction walkover will form a consensus as to whether the culvert merits replacement during access road preparation or during the restoration phase. If it is determined that the culvert is in sufficient condition to be spanned or matted over during construction with little to no risk of waterbody impacts, in areas where extensive construction traffic is anticipated, a decision might be made to replace or remove the culvert during project restoration. In some instances, CMP may determine that the culvert can be removed and the stream restored to a free-flowing condition with no replacement of the culvert necessary.

Off corridor Culvert Replacements

In addition to replacing culverts within CMP controlled lands associated with the Project, CMP will dedicate up to $200,000, sufficient to replace approximately 20-35 culverts on lands outside of CMP's

ownership. CMP proposes to work with MDEP, MDIFW, and interested environmental non-governmental organizations to grant this money to the appropriate entities who can identify those culverts most beneficial to replace, and to manage and oversee their replacement.

Culvert Installation Methodology
A CMP environmental inspector will be present to monitor all culvert removals and installations. CMP will install replacement culverts consistent with Stream Smart principles to improve or maintain habitat connectivity. This includes spanning the entire stream channel, a minimum of 1.2 times the bank full width to eliminate concentrated and accelerated flow; setting the culvert at the correct elevation (i.e., below the elevation of the original stream channel); matching the slope gradient to the stream bottom at the upstream and downstream portions of the crossing; and properly sizing and embedding the culverts to allow for natural streambed substrate in the culvert.

Culvert replacement activities will be avoided during periods of high water and forecasted inclement weather. CMP will replace the culvert under dry conditions by installing temporary coffer dams upstream and downstream of the crossing and pumping the stream flow around the construction area to maintain downstream flows and prevent sedimentation during the culvert installation process. An energy dissipater will be placed at the discharge of the pump-around to prevent stream scour. All pumps will be placed in a secondary containment structure to prevent contaminants from entering the water during pump operation or refueling. In addition, a sufficient number of backup pumps will be available in the event of a pump failure. Spoil piles associated with excavation of the existing culvert will be placed a minimum of 10 feet back from the top of the stream bank and erosion and sedimentation controls will be installed as appropriate on both the upstream and downstream sides of the stream. The new culvert will be installed according to the Stream Smart principles and backfilled using native material or clean stone as appropriate. The downstream coffer dam, followed by the upstream coffer dam, will be removed and water returned to the culvert following the completion of backfill and stabilization of all disturbed areas adjacent to the replacement project.

Culvert Removals and Stream Restoration
It may be determined that an existing culvert is a candidate for removal (without replacement), in order to restore the natural course of a waterbody. In this case, culvert removal will be conducted as described above, temporarily installing coffer dams and pumping the stream flow around the work site. After removal, cobble or clean stone will be used to restore the stream bottom and both stream banks will be sloped to match the existing grade and contour. Disturbed areas will be seeded and stabilized with an erosion control fabric or similar approved erosion control measure. To prevent wildlife entrapment, CMP will not use erosion control fabrics containing monofilament mesh. The use of stone riprap for bank stabilization will be avoided unless otherwise approved by MDEP and the USACE. Silt fence or a functional equivalent shall be installed on both sides of the crossing between the temporarily stabilized banks and any adjacent disturbed areas associated with transmission line construction. After the stream bottom and both banks have been properly stabilized with temporary erosion and sedimentation control measures, pump-around will be halted, coffer dams will be removed, and water will be allowed to flow through the restored area.

Reporting and Post-Construction Monitoring
CMP will document each culvert replacement or removal and will submit a summary report for Condition Compliance to the MDEP and the USACE following construction. In addition, CMP will monitor the conditions of replaced culverts for a period of 1 year following construction and will report any deficiencies and recommended corrective actions to the MDEP and USACE.

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