EXHIBIT A: AGENCY CORRESPONDENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: May 09, 2017
Consultation Code: 05E1ME00-2017-SLI-0579
Event Code: 05E1ME00-2017-E-01091
Project Name: Quebec Maine Interconnect

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

To Whom It May Concern:

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

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

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

A Biological Assessment is required for construction projects (or other undertakings having

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

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

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

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

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

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

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

http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2017-SLI-0579

Event Code: 05E1ME00-2017-E-01091

Project Name: Quebec Maine Interconnect

Project Type: TRANSMISSION LINE

Project Description: Proposed CMP transmission line from Beattie Township to Pownal and Windsor to Wiscasset.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.722717009714806N70.03484380339984W

Counties: Androscoggin, ME | Cumberland, ME | Franklin, ME | Kennebec, ME | Lincoln, ME | Sagadahoc, ME | Somerset, ME

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Canada Lynx *(Lynx canadensis)* Population: Contiguous U.S. DPS There is a **final** critical habitat designated for this species. Your location overlaps the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *(Myotis septentrionalis)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *(Salmo salar)* Population: Gulf of Maine DPS There is a **final** critical habitat designated for this species. Your location overlaps the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *(Isotria medeoloides)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

There are 2 critical habitats wholly or partially within your project area.

NAME	STATUS
Atlantic Salmon *(Salmo salar)*	Final designated
Canada Lynx *(Lynx canadensis)*	Final designated

PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK
COMMISSIONER

June 5, 2017

Lauren Johnston
Burns & McDonnell
27 Pearl Street
Portland, ME 04101

RE: Information Request - Quebec-Maine Interconnect Project

Dear Lauren:

Per your request received May 10, 2017, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *Quebec-Maine Interconnect Project*. Note that as project details are lacking our comments are non-specific and should be considered preliminary. Finally, given the scale of this project (it intersects with multiple MDIFW Regions) we encourage you to continuously seek feedback from our Agency as your project develops.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (*M. lucifugus,* State Endangered); northern long-eared bat (*M. septentrionalis,* State Endangered); and eastern small-footed bat (*M. leibii,* State Threatened). The five remaining bat species are listed as Special Concern: big brown bat (*Eptesicus fuscus*); red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*).

While a comprehensive statewide inventory for bats has not been completed, it is likely that several of these species occur within the project area during migration and/or the breeding season. Generally, our Agency does not anticipate significant impacts to any of the bat species as a result of this project; however, ongoing MDIFW research is indicating that habitat features such as rocky features, outcrops, and talus slopes represent increased concerns for *Myotis* bats. As this project develops, please consult with MDIFW small mammal biologist Cory Mosby (207-941-4473) so that avoiding impacts to these rocky habitat features and/or possible acoustic monitoring are taken into consideration during project design.

Finally, we recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, 207-902-1569) for further guidance, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act.

Northern bog lemming

Our Agency's traditional view of northern bog lemmings, a State Threatened Species under MESA, is that they typically occur in moist, wet meadows or boggy areas, often in conjunction with artic or alpine tundra and spruce-fir forests at elevations >2,700 feet. However, new encounters from northern Maine have changed our understanding of the distribution and habitat requirements of the species. Those data indicate lush sphagnum peatlands at almost any elevation are sometimes used. In addition, research in New Brunswick indicates that northern bog lemming may not only be restricted to wetlands with sphagnum mats; northern bog lemmings have been found in New Brunswick associated with riparian areas with no sphagnum present. Based on this information the species may be found in Maine at any riparian area with abundant streamside herbaceous vegetation at elevations around 1,000 feet.

As your project continues to undergo design, please consult with MDIFW small mammal biologist Cory Mosby (207-941-4473) for site-specific planning and the need for possible surveys for this species in the northern segment of your project.

Rare mussels

Several species of rare mussels have been documented along the proposed transmission line corridor including the brook floater (State Threatened); the yellow lampmussel (State Threatened); the tidewater mucket (State Threatened); and the creeper (Special Concern). These rare animals have experienced significant declines throughout their ranges, with many populations being extirpated due to low population densities, fragmented distributions, and limited or no evidence of recruitment. Because they require clean, free-flowing riverine habitat, they are especially vulnerable to impacts from pollution, sedimentation, dams, and surrounding land use practices that degrade or alter its aquatic habitat. As riparian clearing or construction, including stream crossings, are presumably being considered as part of this project we recommend that riparian buffers remain intact to at least 100-feet wide in rare mussel-bearing water courses. Within these 100-foot buffers we further recommend that:

only capable species >8-10 feet tall would be cut (i.e., no other vegetation is cut);
herbicide use would not be allowed;
avoid and minimize pole placement;
prohibit equipment in the stream channels (i.e., must cross on temporary bridges)

Please contact Beth Swartz in our Bangor office (207-941-4476) to discuss project details and the potential need for possible surveys for these species.

Roaring Brook Mayfly

Roaring Brook mayfly, a State-listed Threatened Species, is known to be in the northern portions of the project area. Any instream work in unmapped perennial or intermittent streams has the potential to

impact this species. They can occur in high elevation, perennial headwater streams draining off forested (hardwood or mixed) slopes at or above 1,000 feet (including unmapped streams) within or adjacent to the currently documented range (northern Appalachian Mountain Range, stretching from Mt. Katahdin to western border with New Hampshire and Quebec). Please contact Beth Swartz in our Bangor office (207-941-4476) to discuss project details and the potential need for possible surveys for these species.

Northern Spring Salamander

Northern spring salamanders, a State-listed Species of Special Concern, are known to be in the northern portions of the project area. Any instream work in unmapped perennial or intermittent streams has the potential to impact this species (i.e., high elevation headwater streams) but they are also found in larger third order streams and rivers with suitable substrate (large cobble and/or gravel bars) within the documented range of primarily the western Maine mountains north and east into mountains of central Penobscot County. Please contact Beth Swartz in our Bangor office (207-941-4476) to discuss project details and the potential need for possible surveys for these species.

Canada lynx

Canada lynx are listed as a Species of Special Concern in Maine and are known to be in the northern portions of the project area. As Canada lynx are listed as a Threatened species under the Federal Endangered Species Act, MDIFW will defer recommendations to the U.S. Fish and Wildlife Service.

Bicknell's thrush

Portions of the northern project search area intersect with occurrences of Bicknell's Thrush, a Species of Special Concern. Bicknell's thrush can be found in sub-alpine forests usually dominated by balsam fir and red spruce at elevations around 2,700 feet that typically have a history of disturbance resulting in a stunted dense understory. Because breeding individuals are known to abandon their nests as a result of even the most miniscule disturbance, please consult wildlife biologist Adrienne Leppold (207- 941-4482) with the Bird Group at our Bangor Headquarters for site-specific planning and the need for possible surveys for this species in the northern segment of your project.

Rusty blackbird

Portions of the northern project search area intersect with occurrences of rusty blackbird, a Species of Special Concern. Please consult with wildlife biologist Adrienne Leppold (207- 941-4482) with the Bird Group at our Bangor Headquarters for site-specific planning and the need for possible surveys for this species in the northern segment of your project.

Great Blue Herons

The great blue heron is a State Species of Special Concern due to a 64% decline in the coastal breeding population observed from 1983 to 2009. Since 2009, MDIFW has been monitoring the statewide population to determine if the decline seen along the coast is also occurring statewide. Not all great blue heron colonies have been mapped in Maine; therefore, please contact wildlife biologist Danielle D'Auria

(207- 941-4478) with the Bird Group at our Bangor Headquarters for further guidance as well as the need for possible surveys along the length of your project.

Bald Eagle/Raptors

Bald eagles are federally protected by the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act under the U.S. Fish and Wildlife Service (USFWS). The USFWS has management authority over eagles; therefore, we recommend that you contact the USFWS Maine Fish and Wildlife Complex at (207) 469-7300 for guidance to avoid or minimize impacts to this species. However, MDIFW staff works closely with the USFWS on the protection of this species, as well as for the protection of raptors in general. Therefore, we recommend that you contact MDIFW raptor specialist Erynn Call (207-941-4481) for further guidance to minimize potential impacts to these species.

Wood turtle

Occurrences of wood turtle, a State Species of Special Concern, have been documented within the search area of the proposed project. Wood turtles use a mix of aquatic and terrestrial habitats throughout the year including meadows, shrub thickets, farmland, and deciduous forests as well as bogs, forested wetlands, vernal pools, and streams. Generally this species appears to prefer edge-associated terrestrial habitats as riparian areas and forest-opening edges have dense shrubbery or ground cover for protection and food, and provide open areas for basking to regulate their body temperature. We recommend that you contact wildlife biologist Derek Yorks (207- 941-4475) with our Reptile, Amphibian, and Invertebrate Group for any site-specific data for your project, as well as the need for possible surveys for this species.

Other Rare Invertebrate Species

Given the various locations and scale of the project other rare species of invertebrates, including the scarlet bluet butterfly and possible rare dragonfly species, could found within the project area. Please contact wildlife biologist Phillip deMaynadier (207- 941-4239) with our Reptile, Amphibian, and Invertebrate Group to discuss project details and the potential need for possible surveys for these species.

American eel

Many of the ponds and streams in the project area contain American eel, which are a Species of Special Concern in Maine. In general, the preferred instream work window of July 15 through October 1 along with construction Best Management Practices should minimize impacts to the species.

Significant Wildlife Habitat

Deer Wintering Areas

Several mapped Deer Winter Areas (DWAs) occur within the project review study area. DWAs contain habitat cover components that provide conditions where deer find protection from deep snow and cold

wind which is important for overwinter survival. MDIFW recommends that development projects be designed to avoid losses or impacts to the continued availability of coniferous winter shelter. Any removal of vegetation should be conducted in such a way that improves the quality and vigor of the coniferous species providing this winter shelter. Particularly in the northwestern segment of the project, any clearing within the project area corridor could severely limit deer's ability to get across the right-of-way (ROW) to the other side of the DWA and could be a complete barrier during significant snow. MDIFW has explored avoidance in minimization efforts with various wind power applicants whose generation lines intersected with DWAs including full avoidance (altering the path of the proposed ROW), feathering of trees, and the use of much larger structures to span the DWAs, thus allowing vegetative cover and their value to remain intact. Throughout the design phase we recommend that you refer to the attached Recommended Performance Standards for Deer Wintering Areas in Overhead Utility ROW Projects (March 2012).

Inland Waterfowl and Wading Bird Habitats

This project intersects or appears to be immediately adjacent to several Inland Waterfowl and Wading Bird Habitats (IWWHs). These habitats provide important breeding, feeding, migration, staging, and wintering habitat for waterfowl and wading bird species. High and moderate value IWWHs within the study area includes both the wetland complex and a 250-foot upland zone. We recommend that these resources be avoided, including no clearing within the 250-foot undisturbed buffer from the wetland edge. Please contact our Agency for guidance to minimize the impacts to these important resources. Throughout the design phase we recommend that you refer to the attached Recommended Performance Standards for Inland Waterfowl and Wading Bird Habitats in Overhead Utility ROW Projects (March 2012).

Significant Vernal Pools

This project intersects with several mapped Significant Vernal Pools; however, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Surveys for vernal pools in the project boundary will need to be conducted prior to final project design to determine whether there are other Significant Vernal Pools present. Once surveys are completed, our Department will need to verify vernal pool data sheets prior to final determination of significance. Please contact Beth Swartz in our Bangor office (207-941-4476) to discuss project details and survey needs. Throughout the design phase we recommend that you refer to the attached Recommended Performance Standards for Maine's Significant Vernal Pools in Overhead Utility ROW Projects (March 2012).

Fisheries Habitat Concerns

Most of the streams, rivers, and ponds within the project boundary support wild brook trout. MDIFW recommends that 100-foot riparian buffers be maintained along all waterbodies, including intermittent and ephemeral streams, within the project area. To be effective, these 100-foot buffers should be measured from the upland edge of stream or associated fringe and floodplain wetlands. Maintaining buffers along coldwater fisheries is critical to the protection of water temperatures, water quality, and inputs of coarse woody debris necessary to support conditions required by brook trout. Stream crossings should be avoided, but if a stream crossing is necessary it should be designed to provide adequate fish passage. Generally, MDIFW recommends that all new and replacement stream crossings, including

temporary crossings, be sized to span 1.2 times the bankfull width of the stream. In addition, we generally recommend that any permanent stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts to stream habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1. Finally, throughout the design phase we recommend that you refer to the attached Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects (March 2012).

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

John Perry
Environmental Review Coordinator

MEMORANDUM OF CONVERSATION
New England Clean Energy Connect (NECEC)

***Contact**:* *Wende Mehaney and Mark McCollough*
***Title**:* *Biologists*
Affiliation: *USFWS*
***Date**:* *June 6, 2017*

Attendees: ***Lauren Johnston, BMCD***
Wende Mehaney, USFWS
Mark McCollough, USFWS

Discussion:
Lauren Johnston contacted Wende Mahaney and Mark McCollough in preparation for the Interagency Resource Consultation Meeting to be held on June 7, 2017. Lauren indicated the purpose of this discussion was how to best prepare for the upcoming meeting. Lauren stated that she created a table for all concern areas and species. She indicated that the meeting would likely be structured by going through each species for general discussion.

Wende and Mark provided a summary of what they would likely be discussing in the next day's meeting.

Mark discussed the following topics and details:

- Canada Lynx-
    - Federally listed but not state listed.
    - Want to look at effect that clearing will have on critical habitat.
    - We only have a few wind power projects to look at as examples.
    - Suggested that an analysis of different habitat types with in the corridor be conducted, specifically looking for spruce-fir, acreage, forest condition (young vs. old).
    -
- Small whorled pogonia
- Bald eagle

Wende discussed the following topics and details:
Northern Long-eared bat

- Atlantic Salmon

Mark discussed bumblebees.

- Rusty Patch bumblebee
- Yellow banded bumble bee

Vernal pools were generally discussed by the group.

MEETING MINUTES
QMI Wildlife and Fisheries Consultation Meeting

***Contact**:* *Mark Goodwin*
***Title**:* *Environmental Manager - Burns & McDonnell*
***Date**:* *June 7, 2017*
Time: *9:00am-11:30am*
Location: *CMP, Augusta*

Attendees:

Gerry Mirabile- CMP
Adam Marquis-CMP
Mark Goodwin- Burns & McDonnell
Lauren Johnston- Burns & McDonnell
Bob Stratton- MDIFW
John Perry- MDIFW
John Mclaire- MDIFW
Don Cameron- MNAP
Jay Clement- USACE
Mark McCollough- USFWS
Wende Mahaney- USFWS

Sign-in sheet and meeting agenda attached

Discussion:

The meeting began with introductions. Department of Energy (DOE) representative has not been identified as of the date of this meeting. DOE will likely be the lead agency for Section 7 consultation, however that will be determined in the Presidential permit pre-submission meeting. Jay Clement has requested attendance to this meeting.

A summary of information received to date from the agencies was provided by Lauren Johnston (BMCD).

- USFWS has provided shapefile for bald eagle nest locations. Wende Mehaney (USFWS) stated that this project does not need follow the "step process" identified on the USFWS website or submit a "species summary table" since we will be making regular contact during the consultation process. Burns & McDonnell has obtained the Official Species List.
- MDIFW has provided a shapefile which contains: DWA, SVP buffers, riparian buffers, WWH, and RTE. Also received was an Information Request response letter (dated June 5, 2017) with enclosed Recommended Performance Standards for Riparian Buffers, SVPs, IWWH, and DWA (dated March 26, 2012).

- MNAP has provided a shapefile which contains botanical features documented within 1,000-feet of the QMI transmission line as well as a letter response (dated June 6, 2017).

Boyle Associates has completed delineation and field verification surveys for wetlands and vernal pools. GIS information for all delineations and verifications will be submitted. Data sheets will be submitted for all pools. MDIFW asked to BMCD to provide 2017 Resource Delineation Protocol (including previously mapped resources). MDIFW would like the data sheets submitted as soon as possible and noted that they can be submitted in smaller batches so they can begin review and determination of significance. MDIFW stated that vernal pool determinations will take the most time so getting started as soon as possible is beneficial.

Wildlife discussions were provided by each agency as follows:

USFWS: Mark McCollough and Wende Mehaney

Canada Lynx

- Critical habitat (CH) includes the greenfield line from the Quebec border to a location near The Forks.
- Section 7 review area is broader than the CH area (two differently mapped areas). USFWS will provide a GIS shapefile for this.
- A biological assessment (BA) should be considered for the lynx (and all federally listed species in the project area). The federal agency is responsible for the BA however it is often applicant prepared.
- Likely no survey would be needed as lynx are presumed to be in the project area.
- There is existing survey information from MDIFW and it is recommended that we compile this. They have information regarding documented occurrences for the past few years. Contact Jen Vashon (MDIFW).
- The BA should include effects of clearing on CH. Should include total area cleared, how much spruce/fir habitat to be cleared, how much young vs old spruce/fir habitat to be cleared. There is a high population of snowshoe hare associated with young spruce/fir habitat.
- To determine presence of lynx habitat (ie young spruce/fir stands) we could obtain "stand maps" from landowners or complete a habitat analysis based on aerial photography images. USFWS can provide guidance and protocols for the desktop analysis.
- Scientific literature indicates that Canada Lynx are reluctant to cross 300-feet of cleared area. BMCD noted that the greenfield portion of transmission line will be cleared to a width of 150-feet and in collocated corridors, the width will not exceed 225-feet in most locations. BA should include some information regarding lynx movement and areas to be cleared.
- BA should include vegetation management standards and the conditions of the ROW post-construction.
- John Perry (MDIFW) will provide contact information for Jen Vashon who is the Lynx biologist at MDIFW. BMCD to contact Jen for survey data and recommendations.

- John Perry noted that MDIFW asked for track surveys during winter conditions for the Number 9 wind farm project.

Eagles

- *Bald Eagles*
    - Bald eagles/golden eagles are protected by the Eagle Act. Setback is 660-feet from the bald eagle nest.
    - If CMP needs to pursue a Take Permit, it will take some time.
    - Last survey effort for bald eagles was in 2013.
    - GIS data provided by USFW has a buffer of 3-miles.
    - Eagles are most likely to be found within ¼ mile of a large wetland or waterbody.
    - Surveys will need to be conducted for the whole line but we should identify areas more likely to contain nest sites.
    - Marker balls are a minimization measure for areas near the eagle nests.
    - Contact Charlie Todd (MDIFW) for survey guidance.
    - Two surveys are recommended: one when the eagles are starting to nest and one when the chicks have hatched.
    - Prior to survey, we should draft a scope of work (SOW)/work plan and provide to USFWS for review.
    - Timing of the survey dates for will vary because of the range of the project. In the south the target date for surveys will be mid-March. In the north, the target date for surveys will be in April. A second survey should be conducted two months afterwards.
- Golden eagles
    - USFWS did not include golden eagle occurrences in GIS shapefile
    - Northern portion of the project has historic nest locations.
    - Look at MDIFW database for historic nest locations and contact Charlie Todd (MDIFW) for recommendations
    - Cliff faces may provide nest sites
    - Bob Stratton (MDIFW) indicated that one mapped golden eagle location on MDIFW is 5-miles from the project area.
    - No known nesting pairs in the state since 2001. There is one radio tagged eagle (currently deceased) with data that we may want to consider.
    - If peregrine falcons are present, eagles are often absent.

Northern Long-eared bat

- Federally and state listed
- USFWS has streamlined consultation process which assumes presence.
- Streamlined consultations has no requirements for surveys (surveys are optional)
- If CMP decides to do surveys, USFWS can provide a survey protocol.
- MDIFW stated that clearing is generally not an issue and they also don't require surveys.

- John Perry (MDIFW) indicated that Cory Mosby (MDIFW Small mammal biologist) may have some heightened concerned around any rocky features, talus slopes and we should discuss surveys and acoustic monitoring recommendations near any similar potential habitat areas..
- Mark Goodwin (BMcD) discussed modifying in corridor access and structure location to avoid habitat.
- Aerial imagery work to identify rocky features and talus slopes may be recommended in consultation.
- Wende Mehaney (USFWS) indicated that time of year restrictions (TOYR) are not required by USFWS; however, the federal action agency may require TOYRs.
- USFWS recommends winter clearing and the action agency will likely encourage the applicant to agree to no clearing between June 1 and July 31.
- For the streamlined process USFWS will need to know total acreage of tree clearing.
- An Incidental Take permit (ITP) is an option if there is known bat activity in the vicinity of the project. ITP's are voluntary if there a potential take and may provide a level of liability to CMP.
- The status of the Northern long-eared bat could change to endangered and the 4(D) rule would no longer be applicable. This may be a consideration for longer term projects.
- Bat surveys are good for 3 years.

Atlantic Salmon

- During MPRP we avoided in-stream crossings, access for QMI is still being developed.
- QMI project area is in the Gulf of Maine Distinct Population Segment (GOM DPS) and Critical Habitat (CH). CH is a subset GOM DPS.
- Identify stream crossings in a table and whether each stream is DPS/CH or coldwater fisheries (MDIFW).
- Direct effects are work in streams, permanent or long-term crossings. Indirect effects are clearing, erosion and sediment control (E&S).
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Action Items:

<u>BMCD follow up items:</u>

- Provide agencies a copy of 2017 Resource Delineation Protocol (including previously mapped resources)
- Submit vernal pool data sheets to MDIFW as they are submitted by Boyle Associates.
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- Contact USFWS for BA outline.
- Contact Jen Vashon (MDIFW) regarding Canada Lynx occurrences near the project area.
- Create stream crossings in a table identify: Atlantic Salmon GOF DPS, CH (USFWS) or coldwater fisheries (MDIFW).
- BMCD to reach out to MDIFW for brook trout GIS layer.
- Is there a BPL intersect?
- Is there an intersect with the Coldwater parcel?

- Review invasive species plan and current invasive species list on USACE website.
- Evaluate the need for laydown areas and additional clearing needs.

MEETING MINUTES
QMI Wildlife and Fisheries Consultation Meeting

***Contact**:* *Mark Goodwin*
***Title**:* *Environmental Manager - Burns & McDonnell*
***Date**:* *June 7, 2017*
Time: *9:00am-11:30am*
Location: *CMP, Augusta*

Attendees:

Gerry Mirabile- CMP
Adam Marquis-CMP
Mark Goodwin- Burns & McDonnell
Lauren Johnston- Burns & McDonnell
Bob Stratton- MDIFW
John Perry- MDIFW
John Mclaire- MDIFW
Don Cameron- MNAP
Jay Clement- USACE
Mark McCollough- USFWS
Wende Mahaney- USFWS

Sign-in sheet and meeting agenda attached

Discussion:

The meeting began with introductions. Department of Energy (DOE) representative has not been identified as of the date of this meeting. DOE will likely be the lead agency for Section 7 consultation, however that will be determined in the Presidential permit pre-submission meeting. Jay Clement has requested attendance to this meeting.

A summary of information received to date from the agencies was provided by Lauren Johnston (BMCD).

- USFWS has provided shapefile for bald eagle nest locations. Wende Mehaney (USFWS) stated that this project does not need follow the "step process" identified on the USFWS website or submit a "species summary table" since we will be making regular contact during the consultation process. Burns & McDonnell has obtained the Official Species List.
- MDIFW has provided a shapefile which contains: DWA, SVP buffers, riparian buffers, WWH, and RTE. Also received was an Information Request response letter (dated June 5, 2017) with enclosed Recommended Performance Standards for Riparian Buffers, SVPs, IWWH, and DWA (dated March 26, 2012).

- MNAP has provided a shapefile which contains botanical features documented within 1,000-feet of the QMI transmission line as well as a letter response (dated June 6, 2017).

Boyle Associates has completed delineation and field verification surveys for wetlands and vernal pools. GIS information for all delineations and verifications will be submitted. Data sheets will be submitted for all pools. MDIFW asked to BMCD to provide 2017 Resource Delineation Protocol (including previously mapped resources). MDIFW would like the data sheets submitted as soon as possible and noted that they can be submitted in smaller batches so they can begin review and determination of significance. MDIFW stated that vernal pool determinations will take the most time so getting started as soon as possible is beneficial.

Wildlife discussions were provided by each agency as follows:

USFWS: Mark McCollough and Wende Mehaney

Canada Lynx

- Critical habitat (CH) includes the greenfield line from the Quebec border to a location near The Forks.
- Section 7 review area is broader than the CH area (two differently mapped areas). USFWS will provide a GIS shapefile for this.
- A biological assessment (BA) should be considered for the lynx (and all federally listed species in the project area). The federal agency is responsible for the BA however it is often applicant prepared.
- Likely no survey would be needed as lynx are presumed to be in the project area.
- There is existing survey information from MDIFW and it is recommended that we compile this. They have information regarding documented occurrences for the past few years. Contact Jen Vashon (MDIFW).
- The BA should include effects of clearing on CH. Should include total area cleared, how much spruce/fir habitat to be cleared, how much young vs old spruce/fir habitat to be cleared. There is a high population of snowshoe hare associated with young spruce/fir habitat.
- To determine presence of lynx habitat (ie young spruce/fir stands) we could obtain "stand maps" from landowners or complete a habitat analysis based on aerial photography images. USFWS can provide guidance and protocols for the desktop analysis.
- Scientific literature indicates that Canada Lynx are reluctant to cross 300-feet of cleared area. BMCD noted that the greenfield portion of transmission line will be cleared to a width of 150-feet and in collocated corridors, the width will not exceed 225-feet in most locations. BA should include some information regarding lynx movement and areas to be cleared.
- BA should include vegetation management standards and the conditions of the ROW post-construction.
- John Perry (MDIFW) will provide contact information for Jen Vashon who is the Lynx biologist at MDIFW. BMCD to contact Jen for survey data and recommendations.

- John Perry noted that MDIFW asked for track surveys during winter conditions for the Number 9 wind farm project.

Eagles

- *Bald Eagles*
    - Bald eagles/golden eagles are protected by the Eagle Act. Setback is 660-feet from the bald eagle nest.
    - If CMP needs to pursue a Take Permit, it will take some time.
    - Last survey effort for bald eagles was in 2013.
    - GIS data provided by USFW has a buffer of 3-miles.
    - Eagles are most likely to be found within ¼ mile of a large wetland or waterbody.
    - Surveys will need to be conducted for the whole line but we should identify areas more likely to contain nest sites.
    - Marker balls are a minimization measure for areas near the eagle nests.
    - Contact Charlie Todd (MDIFW) for survey guidance.
    - Two surveys are recommended: one when the eagles are starting to nest and one when the chicks have hatched.
    - Prior to survey, we should draft a scope of work (SOW)/work plan and provide to USFWS for review.
    - Timing of the survey dates for will vary because of the range of the project. In the south the target date for surveys will be mid-March. In the north, the target date for surveys will be in April. A second survey should be conducted two months afterwards.
- Golden eagles
    - USFWS did not include golden eagle occurrences in GIS shapefile
    - Northern portion of the project has historic nest locations.
    - Look at MDIFW database for historic nest locations and contact Charlie Todd (MDIFW) for recommendations
    - Cliff faces may provide nest sites
    - Bob Stratton (MDIFW) indicated that one mapped golden eagle location on MDIFW is 5-miles from the project area.
    - No known nesting pairs in the state since 2001. There is one radio tagged eagle (currently deceased) with data that we may want to consider.
    - If peregrine falcons are present, eagles are often absent.

Northern Long-eared bat

- Federally and state listed
- USFWS has streamlined consultation process which assumes presence.
- Streamlined consultations has no requirements for surveys (surveys are optional)
- If CMP decides to do surveys, USFWS can provide a survey protocol.
- MDIFW stated that clearing is generally not an issue and they also don't require surveys.

- John Perry (MDIFW) indicated that Cory Mosby (MDIFW Small mammal biologist) may have some heightened concerned around any rocky features, talus slopes and we should discuss surveys and acoustic monitoring recommendations near any similar potential habitat areas..
- Mark Goodwin (BMcD) discussed modifying in corridor access and structure location to avoid habitat.
- Aerial imagery work to identify rocky features and talus slopes may be recommended in consultation.
- Wende Mehaney (USFWS) indicated that time of year restrictions (TOYR) are not required by USFWS; however, the federal action agency may require TOYRs.
- USFWS recommends winter clearing and the action agency will likely encourage the applicant to agree to no clearing between June 1 and July 31.
- For the streamlined process USFWS will need to know total acreage of tree clearing.
- An Incidental Take permit (ITP) is an option if there is known bat activity in the vicinity of the project. ITP's are voluntary if there a potential take and may provide a level of liability to CMP.
- The status of the Northern long-eared bat could change to endangered and the 4(D) rule would no longer be applicable. This may be a consideration for longer term projects.
- Bat surveys are good for 3 years.

Atlantic Salmon

- During MPRP we avoided in-stream crossings, access for QMI is still being developed.
- QMI project area is in the Gulf of Maine Distinct Population Segment (GOM DPS) and Critical Habitat (CH). CH is a subset GOM DPS.
- Identify stream crossings in a table and whether each stream is DPS/CH or coldwater fisheries (MDIFW).
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Asali, Natasha

From: Mahaney, Wende <wende_mahaney@fws.gov>
Sent: Friday, June 23, 2017 9:13 AM
To: Johnston, Lauren A
Cc: Mark McCollough (Mark_McCollough@fws.gov) (Mark_McCollough@fws.gov); Goodwin, Mark; Morin, James
Subject: Re: QMI Canada lynx Section 7 review area shapefile
Attachments: A073_V01_53411.zip

Hi Lauren - Attached is the shapefile of the section 7 review area for Canada lynx. As Mark noted during our meeting, this is a broader area of Maine than what is currently designated as critical habitat for lynx.

Wende

Wende S. Mahaney, C.W.B.
U.S. Fish and Wildlife Service
Maine Field Office
P.O. Box A (mailing address)
306 Hatchery Road (physical address)
East Orland, Maine 04431
Telephone: (207) 902-1569 (direct line)
Fax: (207) 902-1588
Cellular Phone: 207-944-2991

On Thu, Jun 22, 2017 at 4:05 PM, Johnston, Lauren A <lajohnston@burnsmcd.com> wrote:

> Good afternoon Mark,
> I have a follow-up item from the June 7, 2017 meeting to request a shapefile from USFWS for the Canada lynx Section 7 review area. My notes indicate that this area extends further than the DPS. Could you provide this to assist in our review?
>
> Thank you!
>
> **Lauren Johnston, CPESC** \ Burns & McDonnell
>
> Senior Environmental Scientist
>
> **Mobile** 207-272-7294 **Office** 207-517-8483
>
> lajohnston@burnsmcd.com \ burnsmcd.com
>
> 27 Pearl Street \ Portland, ME 04101
>
> View my profile on LinkedIn
>
>

Please consider the environment before printing this email.

Johnston, Lauren A

From: Mahaney, Wende <wende_mahaney@fws.gov>
Sent: Monday, August 14, 2017 3:35 PM
To: Johnston, Lauren A
Cc: Mosby, Cory E; Perry, John; Stratton, Robert D; Marquis, Adam; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com); Goodwin, Mark; McCollough, Mark; Clement, Jay L NAE; Mills, Brian
Subject: Re: FW: Northern Long Eared Bat Hibernacula

Lauren - This conversation is one we will need to have with the federal action agencies, DOE and ACOE. Ultimately through the ESA section 7 consultation process, the federal action agencies will decide what, if any, restrictions they want to place on the project to protect federally listed species including the northern long-eared bat. This may or may not include a restriction on when tree clearing can be done.

In Maine we consider the "active" bat season throughout the state to be April 20 through October 15 (based on review of acoustic bat survey data from a variety of projects in Maine). I am not aware of any information that would support tweaking these dates for particular regions of the state. Given that there is not much bat research going on in Maine, that might be difficult to do. So, I can't offer a different recommendation for more northern parts of the project versus other locations. But if someone has information to bring to the table for consideration, we can certainly do that as part of the consultation process with DOE and ACOE.

Wende

Wende S. Mahaney, C.W.B.
U.S. Fish and Wildlife Service
Maine Field Office
P.O. Box A (mailing address)
306 Hatchery Road (physical address)
East Orland, Maine 04431
Telephone: (207) 902-1569 (direct line)
Fax: (207) 902-1588
Cellular Phone: 207-944-2991

On Fri, Aug 11, 2017 at 12:58 PM, Johnston, Lauren A <lajohnston@burnsmcd.com> wrote:

> Wende,
>
> Please find the correspondence below with the MDIFW regarding our inquiry into the northern long eared bat behavior and the length of the “active season” in the northern sections of the NECEC project. We initially contacted Cory since he has intimate knowledge of federal and state protected bats and their behavior within Maine, however, it may have been appropriate to start with the USFWS biologist opinion for the NLEB since the recommended conservation measures are issued federally. Could you review the following inquiry and kindly respond, as we are assessing our management options to properly protect this species.

In evaluating the time of year recommendations for tree removal activities, necessitated by the new transmission line, the Corps has been referencing the broader “active season” (April 1 through October 31) on certain projects. This is an additional voluntary conservation measure recommended by USFWS to the Federal action agency in the Biological Opinion on the Final 4(d) Rule . This time of year recommendation is more restrictive than the NLEB “pup-season” (June 1 to July 31), proposed by the streamlined section 7 consultation implemented by the USFWS.

CMP is inquiring if there could be flexibility in the “active season” time of year recommendation, based on higher elevation and latitude; and, the longer winter and snow cover season in the northern portions of the project area. The active season includes the “pup season” and from a climate perspective, is there a difference in when NLEB becomes active in the northern reaches of the NECEC Project? If so, would it be appropriate for a shortened active season to be applied from, the town of Moscow north to the Canadian border? This request is also based on the significant logistical/construction impact challenges of a 7-month no-cut period.

If you’d like to talk more in length regarding this, I’d be happy to schedule a call.

Thanks for in advance for your opinion.

Lauren Johnston, CPESC \ Burns & McDonnell

Senior Environmental Scientist

Mobile 207-272-7294 **Office** 207-517-8483

lajohnston@burnsmcd.com \ burnsmcd.com

27 Pearl Street \ Portland, ME 04101

View my profile on LinkedIn

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From: Mosby, Cory E [mailto:Cory.E.Mosby@maine.gov]
Sent: Thursday, August 10, 2017 2:49 PM
To: Johnston, Lauren A <lajohnston@burnsmcd.com>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>; Perry, John <John.Perry@maine.gov>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Marquis, Adam <adam.marquis@cmpco.com>
Subject: RE: Northern Long Eared Bat Hibernacula

Lauren,

I can only weigh in from a state government perspective, and it sounds like the recommended voluntary conservation measure is a US Corps/USFWS recommendation, not IFW. The active season they refer to is determined by USFWS biologist, not IFW.

Sorry that's not much help. Let me know if there's anything else I can do.

Cheers,

Cory Mosby

Furbearer and Small Mammal Biologist

Maine Department of Inland Fisheries and Wildlife

650 State St.

Bangor, ME 04401

207-941-4473 office

From: Johnston, Lauren A [mailto:lajohnston@burnsmcd.com]
Sent: Thursday, August 10, 2017 1:08 PM
To: Mosby, Cory E
Cc: Goodwin, Mark; Perry, John; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com); Stratton, Robert D; Marquis, Adam
Subject: RE: Northern Long Eared Bat Hibernacula

Hi Corey,

We are looking at NECEC projects' management strategies for protection of the NLEB. In evaluating the time of year recommendations for tree removal activities, necessitated by the new transmission line, the Corps has been referencing the broader "active season" (April 1 through October 31) on certain projects. This is an additional voluntary conservation measure recommended by USFWS to the Federal action agency in the Biological Opinion on the Final 4(d) Rule . This time of year recommendation is more restrictive than the NLEB "pup-season" (June 1 to July 31), proposed by the streamlined section 7 consultation implemented by the USFWS.

CMP is inquiring if there could be flexibility in the "active season" time of year recommendation, based on higher elevation and latitude; and, the longer winter and snow cover season in the northern portions of the project area. The active season includes the "pup season" and from a climate perspective, is there a difference in when NLEB becomes active in the northern reaches of the NECEC Project? If so, would it be appropriate for a shortened active season to be applied from, the town of Moscow north to the Canadian border? This request is also based on the significant logistical/construction impact challenges of a 7-month no-cut period.

If you'd like to talk more in length regarding this, I'd be happy to schedule a call.

Thanks for in advance for your opinion.

Lauren Johnston, CPESC \ Burns & McDonnell

Senior Environmental Scientist

Mobile 207-272-7294 **Office** 207-517-8483

lajohnston@burnsmcd.com \ burnsmcd.com

27 Pearl Street \ Portland, ME 04101

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From: Mosby, Cory E [mailto:Cory.E.Mosby@maine.gov]
Sent: Tuesday, July 18, 2017 10:06 AM
To: Johnston, Lauren A <lajohnston@burnsmcd.com>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>; Perry, John <John.Perry@maine.gov>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>
Subject: RE: Northern Long Eared Bat Hibernacula

Lauren,

Not a problem. Thanks for reaching out.

Known location of maternity roost trees for NLEB: The only known maternity roost trees for NLEB in ME are on Mount Desert Island in hancock county within Acadia National Park.

Of those seven additional bat species you mentioned one is state endangered, the little brown, and the eastern small-footed bat is state threatened. Our known hibernacula for those two species coincide with the hibernacula for NLEB. Additionally we know of no maternity sites for those species in forested settings outside of Acadia National Park on Mount Desert Island.

As far as avoidance recommendations regarding all of these species the list is pretty simple and short. Although not required, attempt to minimize tree removal during the maternity season when the pups are not able to fly and escape a falling tree. This is generally considered the months of June and July. Other than that our known hibernacula are protected and the overarching threat to our listed species of Myotis bat are an invasive fungus that is the causal agent for White-Nose Syndrome.

As for occurrence data, with the exception of eastern small-footed bats these species are widely distributed throughout the state. The current distribution of eastern small footed bats is roughly the southern ½ of the state. Even in a post White-nose environment, both little brown and northern long-eared bats could pop up most any place.

Feel free to contact me if you have any more questions or would like to just talk about bats in greater detail.

Cheers,

Cory

From: Johnston, Lauren A [mailto:lajohnston@burnsmcd.com]
Sent: Monday, July 17, 2017 4:28 PM
To: Mosby, Cory E
Cc: Goodwin, Mark; Perry, John; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com)
Subject: RE: Northern Long Eared Bat Hibernacula

Cory,

Thank you for confirming the location of the NLEB hibernacula in Maine. Are you able to provide known locations of maternity roost trees for the NELB? Do you have any documented occurrences near the CMP transmission line project formerly referred to as the Quebec Maine Interconnect (QMI) and now being called **New England Clean Energy Connect Project or "NECEC."** I can provide a map, kmz or shapefile if needed.

Additionally, the information request letter provided by MDIFW on 6/5/2017, identified seven other bat species which were state protected: little brown bat, eastern small-footed bat, big brown bat, red bat, hoary bat, silver-haired bat and tri-colored bat. Do you have occurrence data or avoidance recommendations regarding these species generally?

Thank you for your time and I look forward to hearing from you.

Lauren Johnston, CPESC \ Burns & McDonnell

Senior Environmental Scientist

Mobile 207-272-7294 **Office** 207-517-8483

lajohnston@burnsmcd.com \ burnsmcd.com

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From: Mosby, Cory E [mailto:Cory.E.Mosby@maine.gov]
Sent: Friday, June 09, 2017 2:58 PM
To: Goodwin, Mark <magoodwin@burnsmcd.com>
Cc: Johnston, Lauren A <lajohnston@burnsmcd.com>
Subject: RE: Northern Long Eared Bat Hibernacula

Mark,

This email is to confirm that the information I provided you regarding the location of known NLEB hibernacula have not changed from the information provided to you as of 3/2/2017.

Thanks and have a good day.

Cory Mosby

Furbearer and Small Mammal Biologist

Maine Department of Inland Fisheries and Wildlife

650 State St.

Bangor, ME 04401

207-941-4473 office

From: Goodwin, Mark [mailto:magoodwin@burnsmcd.com]
Sent: Friday, June 09, 2017 1:21 PM
To: Mosby, Cory E
Cc: Johnston, Lauren A
Subject: RE: Northern Long Eared Bat Hibernacula

Cory:

Can you confirm that the information you provided below is still current as of today's date?

Thank you,

Mark Goodwin, CPESC \ Burns & McDonnell

Senior Environmental Scientist

207-517-8482 \ **Mobile** 207-416-5707

magoodwin@burnsmcd.com \ burnsmcd.com

27 Pearl Street \ Portland, ME 04101

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From: Mosby, Cory E [mailto:Cory.E.Mosby@maine.gov]
Sent: Thursday, March 02, 2017 8:35 AM
To: Goodwin, Mark <magoodwin@burnsmcd.com>
Subject: RE: Northern Long Eared Bat Hibernacula

Hello Mark,

Our northern Long-eared Bat hibernacula are located in Oxford (two hibernacula) and Piscataquis (one hibernacula) counties.

Please feel free to contact me if any other questions arise.

Cheers,

Cory Mosby

Furbearer and Small Mammal Biologist

Maine Department of Inland Fisheries and Wildlife

650 State St.

Bangor, ME 04401

207-941-4473

From: Goodwin, Mark [mailto:magoodwin@burnsmcd.com]
Sent: Monday, February 27, 2017 11:50 AM
To: Mosby, Cory E
Subject: Northern Long Eared Bat Hibernacula

Hi Cory:

Please disregard my earlier voicemail. For consultation purposes (documentation) can you please confirm the county locations of known hibernacula of the Northern Long Eared Bat in the state of Maine as of February 27, 2017.

Thank you,

Mark Goodwin, CPESC \ Burns & McDonnell

Senior Environmental Scientist

207-517-8482 \ **Mobile** 207-416-5707

magoodwin@burnsmcd.com \ burnsmcd.com

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Please consider the environment before printing this email.

Johnston, Lauren A

From: Morin, James
Sent: Tuesday, September 12, 2017 11:35 AM
To: Johnston, Lauren A
Subject: FW: Canada Lynx habitat

From: Morin, James
Sent: Wednesday, July 19, 2017 4:34 PM
To: 'Vashon, Jennifer' <Jennifer.Vashon@maine.gov>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>; gerry.mirabile@cmpco.com; Perry, John <John.Perry@maine.gov>; 'Robert.D.Stratton@maine.gov' <Robert.D.Stratton@maine.gov>
Subject: RE: Canada Lynx habitat

Hi Jen,
I may try to give you a call tomorrow to discuss our project and its impact on lynx habitat. A key question I have is in regards habitat conversion of 150' ROW from managed forest to dense scrub/shrub and its potential effect on snowshoe hare and lynx (positive, negative or no effect).

Thanks,

James P. Morin, LF*, CPESC \ Burns & McDonnell
Sr. Environmental Scientist \ Forester
Office 207-808-4924 \ **Mobile** 207-229-6752
jmorin@burnsmcd.com \ burnsmcd.com
27 Pearl Street \ Portland, Maine 04101

From: Morin, James
Sent: Monday, July 10, 2017 7:58 AM
To: 'Vashon, Jennifer' <Jennifer.Vashon@maine.gov>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>; gerry.mirabile@cmpco.com; adam.marquis@cmpco.com; Kane, Douglas <Douglas.Kane@maine.gov>; Cordes, Robert <Robert.Cordes@maine.gov>; Perry, John <John.Perry@maine.gov>; wende_mahaney@fws.gov; Mark_McCollough@fws.gov
Subject: RE: Canada Lynx habitat

Hi Jennifer,
Please let me know if there is any additional project related information that I can provide you that would be helpful in my request.

Also, do you feel that a project such as this (150' wide transmission line corridor) would have a significant impact to the lynx, snowshoe hare or their habitat?

Thanks,

James P. Morin, LF*, CPESC \ Burns & McDonnell
Sr. Environmental Scientist \ Forester
Office 207-808-4924 \ **Mobile** 207-229-6752
jmorin@burnsmcd.com \ burnsmcd.com
27 Pearl Street \ Portland, Maine 04101

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From: Vashon, Jennifer [mailto:Jennifer.Vashon@maine.gov]
Sent: Thursday, June 29, 2017 2:33 PM
To: Morin, James <jmorin@burnsmcd.com>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>; gerry.mirabile@cmpco.com; adam.marquis@cmpco.com; Kane, Douglas <Douglas.Kane@maine.gov>; Cordes, Robert <Robert.Cordes@maine.gov>; Perry, John <John.Perry@maine.gov>; wende_mahaney@fws.gov; Mark_McCollough@fws.gov
Subject: RE: Canada Lynx habitat

Hi James,

Yes, we have a database with records of lynx observations from a variety of sources. I would be happy to work with you on getting the information you need. I'll work with John and Amy Meehan (a gis analysist) to send you the information asap. I believe a shape file would be helpful, however Amy is in the field today. I'll check with her tomorrow on which file type she would prefer.

Thanks!

Jennifer Vashon
Black Bear and Canada Lynx Biologist
Maine Dept of Inland Fisheries & Wildlife Division
Wildlife Division
650 State St.
Bangor, ME 04401
(207) 941-4238
mefishwildlife.com | facebook | twitter

From: Morin, James [mailto:jmorin@burnsmcd.com]
Sent: Tuesday, June 27, 2017 11:49 AM
To: Vashon, Jennifer
Cc: Goodwin, Mark; Johnston, Lauren A; gerry.mirabile@cmpco.com; adam.marquis@cmpco.com; Kane, Douglas; Cordes, Robert; Perry, John; wende_mahaney@fws.gov; Mark_McCollough@fws.gov
Subject: Canada Lynx habitat

Hi Jennifer,

I am in the process of compiling information on the Canada Lynx associated with the permitting of the proposed Central Maine Power Company (CMP) Quebec-Maine Interconnect Transmission Line project (QMI). The QMI project includes a high-voltage direct current (HVDC) transmission line that would go from Beattie Twp. to The Forks Plt., down to Wyman Dam, and eventually to Larrabee Substation in Lewiston (see attached map). The section of right of way (ROW) between Beattie Twp. and The Forks Plt. would be new corridor. The section from The Forks south to Lewiston would be within existing corridor, however additional widening would be necessary. We are aware that the Canada Lynx Critical Habitat in the project area is generally located between Beattie Twp and the southern border of Johnson Mountain Twp. Additionally, we have been provided with the Section 7 review area shapefile by USFWS and are aware that the review area extends further south to a point near Embden.

John Perry indicated that you maintain an occurrence database that would help us better understand the distribution of Lynx in the project area. He requested that we reach out to you for any potential survey data or known occurrences within the lynx critical habitat of the project ROW, as well as any information that would help us better understand how a newly cleared, 150' wide transmission corridor from Beattie Twp to The Forks Plt. may impact the lynx, its habitat, and snowshoe hare.

My objective is to obtain enough information about the Canada Lynx to be able to address the potential impacts caused by the proposed project, as well as the assessment of any mitigation measures that can be taken during the clearing and construction phases.

I can provide a shapefile or kmz file if that would assist you in your review. I welcome the opportunity to further discuss my request with you if needed at your earliest convenience.

Thanks,

James P. Morin, LF*, CPESC \ Burns & McDonnell
Sr. Environmental Scientist \ Forester
Office 207-808-4924 \ **Mobile** 207-229-6752
jmorin@burnsmcd.com \ burnsmcd.com
27 Pearl Street \ Portland, Maine 04101

*Licensed in: ME

Asali, Natasha

From: Clement, Jay L CIV USARMY CENAE (US) <Jay.L.Clement@usace.army.mil>
Sent: Monday, June 4, 2018 6:44 AM
To: Goodwin, Mark; Mirabile, Gerry J.
Cc: Wende_Mahaney@fws.gov
Subject: FW: [Non-DoD Source] Metrics for lynx assessment NECEC project
Attachments: Maine Lynx_CH_Unit1_2014.pdf

E-copy as requested

-----Original Message-----
From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Thursday, May 31, 2018 12:15 PM
To: Wende Mahaney <wende_mahaney@fws.gov>
Cc: Clement, Jay L CIV USARMY CENAE (US) <Jay.L.Clement@usace.army.mil>
Subject: [Non-DoD Source] Metrics for lynx assessment NECEC project

Wende and Jay:

My apologies, but I am unable to attend the NECEC meeting tomorrow. You can share the following information with Mark Goodwin or others at the meeting with CMP tomorrow.

The proposed powerline corridor from Beattie Township to Johnson Mountain Township is within the designated Canada lynx critical habitat (Figure 7.1, page 7-15 NECEC Site Location Application) and from West Forks Township to Anson Township is within an ESA Section 7 review area where we request Federal agencies to consult with the Service concerning Canada lynx.

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 their 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.

The effects of the NECEC project on lynx should be documented for the Army Corps of Engineer's Biological Assessment. Metrics should include:

* The total amount (acres) of forest clearing (right of way, roads, other clearings) a) in lynx critical habitat and b) within the section 7 review area
* The number of acres of clearing that will be predominantly softwood and mixed softwood (50% or more softwood) a) in lynx critical habitat and b) within the section 7 review area. This information can come from a) landowner stand maps or b) aerial photography interpretation. Given the large number of landowners and various forestry stand mapping systems and reluctance of some to share this proprietary data, aerial photography interpretation may be the preferred and most consistent way to quantify the effects of clearing softwood and mixed wood stands for this project. This habitat is the preferred feeding, denning, and snowshoe hare habitat described in the critical habitat rule.

* The softwood and mixed softwood acres described above should be further classified into current lynx feeding habitat (forest height greater than 10 feet and less than 35 feet or less than 35 years old) and future feeding habitat (forest height less than 10 feet or recently heavily cut and forest greater than 35 feet) a) in lynx critical habitat and b) within the section 7 review area .
* The numbers of acres of clearing that will be predominantly hardwood or mixed hardwood (<50% softwood) a) in lynx critical habitat and b) within the section 7 review area. This is matrix habitat explained in the lynx critical habitat rule.
* Preferably these forest habitat types would be mapped in each of the aforementioned townships so the distribution of lynx potential feeding-denning and matrix habitat is documented.

In addition to the information above, the Army Corps Biological Assessment (BA) should describe CMP plans for managing the NECEC project right of way after construction. 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. A vegetation management plan should be included in the BA. Plans to manage the right of way differently (e.g., low grass, forbs, mowed) should be explained in the BA.

Some BMPs for lynx and their habitat for a right of way project.

* rights of way should be maintained in native shrubs or young forest
* clearings should be minimized to less than 300 feet (lynx are reluctant to cross wider areas)
* coarse woody debris (root wads, tip ups, downed trees) should be maintained on site to improve denning and snowshoe hare habitat
* post-construction access along the right of way (ATV trails, etc.) should be avoided (these can introduce other indirect effects, trapping and hunting, other forms of disturbance to lynx)

The Service will consult with the Army Corps and determination of effects on lynx and their critical habitat based on the information assembled in the BA.

I would be glad to discuss this further with the Corps or the applicant, answer questions, advise, etc.

I hope you have a good meeting.

Sincerely, Mark McCollough

--

Mark McCollough, Ph.D.
Endangered Species Specialist
US Fish and Wildlife Service

Maine Fish and Wildlife Service Complex

Ecological Services
Maine Field Office
P.O. Box A (mailing address)
306 Hatchery Road (physical address)
East Orland, Maine 04431
Telephone: (207) 902-1570

Fax: (207) 902-1588
Cell Phone: 207 944-5709
mark_mccollough@fws.gov <mailto:mark_mccollough@fws.gov>

MEETING MINUTES
NECEC Maine Natural Areas Program Working Session

***Contact**:* *Mark Goodwin*
***Title**:* *Environmental Manager - Burns & McDonnell*
***Date**:* *April 24, 2018*
Time: *1:00pm-3:00pm*
Location: *CMP General Office, Augusta*

Attendees:

Gerry Mirabile- CMP
Mark Goodwin- Burns & McDonnell
Lauren Johnston- Burns & McDonnell
Kristen Puryear- MNAP
Mark McCollough- USFWS (via phone)
Melissa Pauley- USDOE (via phone)

General Discussion: The meeting was structured as a working session with the Maine Natural Areas Program (MNAP) to discuss existing rare plant and exemplary natural community data for the New England Clean Energy Connect Project (NECEC or the Project), landscape analysis for rare plant habitats, and rare plant survey methodology.

The meeting began with Mark Goodwin providing a recap of the data that was included with the Site Location of Development Act application (Site Law) for the Project, including existing survey data. Survey data that was captured by Gilman and Briggs Environmental during the field surveys for the Maine Power Reliability Program (MPRP) included the full width of CMP's corridors from Wyman Hydro dam in Moscow to Surowiec Substation in Pownal (NECEC Segments 3 & 4) and from Coopers Mills Substation in Windsor to Maine Yankee Substation in Wiscasset (NECEC Segment 5). The only portions of the Project not previously surveyed by CMP for the presence of exemplary natural communities and rare plants are Segments 1 and 2 (map attached). Additional existing information in or adjacent to the NECEC Project area includes the documented botanical features provided by MNAP, as well as species data that may be gleaned from the natural resource data forms compiled during NECEC field surveys.

Mark Goodwin asked to what extent MNAP would recommend that CMP resurvey portions of the project area that were subject to previous survey efforts. Kristen responded that CMP should revisit known/documented rare plant and unique natural communities to verify previous findings and document any spatial changes to the occurrences. Kristen confirmed that MNAP would not recommend the survey of areas previously surveyed during MPRP that were found to contain no occurrences of unique or rare botanical features, with the exception of Bowman Field area (Livermore Falls), and with the caveat that CMP would have to survey for small whorled pogonia in forested areas of the project

proposed for clearing consistent with the results of habitat modeling which had identified areas of "higher interest" between Jay and Lewiston on Segment 3. Small whorled pogonia surveys should follow the Survey Protocols for Maine and should occur within the areas to be cleared as well as 150' into the adjacent forested area (or less, if 150' would extend beyond the area where CMP has right, title, or interest). Mark McCollough and Kristen indicated their willingness to assist in reviewing the results of the habitat modeling and other available data for the purpose of further defining the locations that will be subject to small whorled pogonia survey. Mark McCollough also clarified that resurvey for small whorled pogonia, in areas previously surveyed for the MPRP should be completed because USFWS has determined that small whorled pogonia populations have changed significantly in the last 10 years. There was discussion regarding surveying beyond the corridor limits on privately owned land. However, Gerry Mirabile indicated that surveying beyond the corridor limits would have to be visual (i.e., line of sight) because CMP has no right, title, or interest in those areas.

The group then discussed landscape analysis parameters primarily for those areas of the Project that had not been previously surveyed. These parameters included the following unique habitat features:

- Areas of high relief
- Large wetland systems
- Large rivers and streams and associated riparian landforms
- Sandplains/areas of sandy soil
- Exposed bedrock areas
- Any additional habitat features defined by MNAP
- Similar habitats in the corridor adjacent to known occurrences (MNAP may provide a list and/or digital data of adjacent or nearby rare natural community occurrences around Segments 1 &2)

Kristen confirmed that these features were consistent with a survey methodology she drafted for rare plant and exemplary natural communities. Kristen provided CMP with a copy of the survey methodology (attached) and stated that MNAP would like to review CMP's list of targeted survey sites following the completion of the landscape analysis. Mark Goodwin asked how the project should evaluate areas that have been recently disturbed by forestry operations in the portion of the project that is new corridor. Kristen responded that areas that have been disturbed within the last 20-30 years would likely contain lower quality/ranked habitat and would be of lower priority and concern to MNAP. Kristen also stated that in these areas we should still perform surveys in unique community types (e.g., cedar swamps, red pine stands) that have been heavily impacted and that CMP should perform random sampling (supplemental site surveys) every few to several miles in other areas to provide adequate survey coverage.

Mark Goodwin asked about survey timing and Kristen responded that the majority of species can generally be identified between June and August/September, but that floodplain forested areas should be surveyed earlier in the survey window (June) as a number of species in this habitat flower earlier in the growing season. Kristen indicated that MNAP can provide field forms for use in the field and requested their use as it is easier for MNAP to enter the required information into its database.

Mark Goodwin stated that the Project would provide MNAP and USFWS with survey methodology for concurrence prior to initiating the surveys and could provide a .kmz file for use in Google Earth such that MNAP and USFWS could review and comment on the areas that have been identified for survey based on the landscape analysis. Kristen discussed providing CMP with a list of rare plant occurrences for distinct areas of the project (within 5-10 miles). This will help CMP in narrowing down the list of rare plants to those that potentially occur in the region. Kristen also noted that the MNAP website has habitat type/plant associations data that can be used by CMP to help identify which rare plants have the potential to occur in each habitat type. (See fact sheets at: http://www.maine.gov/dacf/mnap/features/community.htm)

Mark Goodwin asked Kristen to define term "qualified biologist". Kristen responded that the surveyors should be under the guidance of a botanist or person with experience in rare plants or plant identification and verified that a field team lead with this experience could provide oversight of other scientists, including wetland scientists, preferably individuals with rare plant survey experience. Mark Goodwin also offered that CMP would be happy to have MNAP participate in some of the field work, and Kristen expressed a willingness to potentially participate. Kristen noted she would be particularly interested in visiting the "Basswood-Ash-Red Maple Floodplain Forest" site identified by Gilman and Briggs in Livermore Falls.

Kristen requested that CMP provide survey data for the rare plants (i.e., Pale Green Orchis and Fall Fimbry) and the natural community (Basswood-Ash-Red Maple Floodplain Forest) for which MNAP has incomplete records. Mark Goodwin and Lauren Johnston confirmed that CMP has shapefile data for these occurrences and would provide it to MNAP. Lauren Johnston also confirmed that CMP would provide the comprehensive Project shapefiles to MNAP such that MNAP could be confident that they are working with the most recent version.

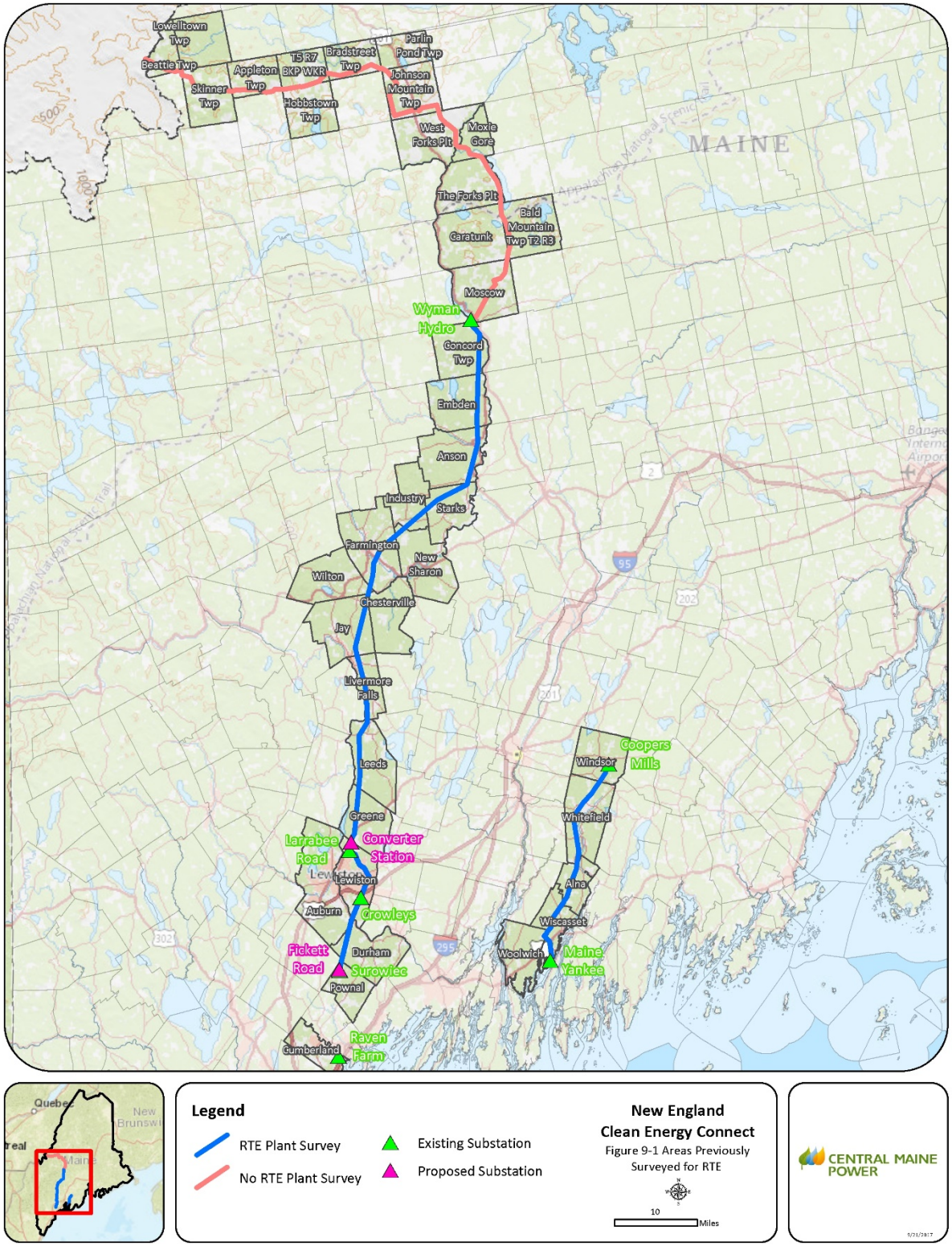
The meeting closed with some comments from Mark McCollough related to Bald Eagles. Mark McCollough asked if CMP would be conducting Bald Eagle Surveys in 2018. Mark Goodwin responded that the first component of the project was currently scheduled for construction in June of 2019 but that it was substation work that is a significant distance from any significant waterbodies and that transmission line construction wasn't scheduled until late 2019. Therefore, CMP had anticipated bald eagle surveys in Spring of 2019. Mark McCollough indicated that if an identified nest in the Project area were to be disturbed, a Bald and Golden Eagle Protection Act Incidental Take Permit (ITP) may be possible, however CMP would want to start the ITP process early as it could take several months to complete. Mark McCollough also mentioned that the Maine Department of Inland Fisheries and Wildlife is currently performing a statewide eagle survey and that new information will be available for next year.

Action Items

- CMP/Burns & McDonnell to provide most recent project shapefile to MNAP
- CMP/Burns & McDonnell to provide available information regarding Pale Green Orchis, Fall Fimbry and Basswood-Ash-Red Maple Floodplain Forest to MNAP
- MNAP to provide survey data forms
- MNAP to provide a list of rare plants within 5-10 miles of distinct portions of the project area to assist CMP with species identification during surveys
- CMP/Burns & McDonnell to develop a proposed RTE landscape and plant survey plan, including specific plant species to be surveyed for in specific landscape/cover types, for MNAP and USFWS review, comment and approval

<End>

Figure 9-1: Areas Previously Surveyed for RTE Plants



Methodology for Surveys of Rare Plant and Exemplary Natural Communities on Right-Of-Way projects

Provided for NECEC Project, CMP
by
Maine Natural Areas Program 2018

1 - Searches are directed to the list of plants protected under federal and Maine state laws (Maine tracking list - see attachment), and to any rare or exemplary natural community as defined by the Maine Natural Areas Program (MNAP). Surveyors should have sufficient experience to be able to identify the majority of the rare species known from the region of the state where the project is proposed.

2 - Sections of proposed transmission ROW located on landscapes known to support relatively high numbers of rare species or have nearby occurrences of significant natural communities should be surveyed in their entirety.

3 - Sections of proposed transmission ROW located on landscapes with few or no known occurrences of rare species or no nearby significant natural communities need not be searched in their entirety. To improve the likelihood of locating any significant natural features that may occur on these segments, a landscape analysis approach may be used. Landscape analysis should include a review of aerial photography, NWI maps, topographic maps, and data supplied by MNAP. Areas identified through landscape analysis as having potential for significant natural features should be searched. Examples of areas to include as priorities for surveys include areas within a certain distance of known populations of rare species or exemplary natural communities, areas of high relief (e.g., steep slopes, valleys), large wetland systems, major streams and rivers, and their associated terraces and landforms, areas of bedrock exposure or talus, red pine or spruce woodlands, sandplains or areas with sandy soil, and cedar swamps and fens. Other types of priority areas may be identified through the landscape analysis.

4 - Any large sections of proposed ROW that are not prioritized for searches should be randomly sampled (at least ~1/4 mile per every few miles) to make sure the landscape analysis results were reasonable. This can be more specifically addressed after MNAP reviews the proposed alignment and can be one of the topics for a meeting with the field consultant.

5 - Rare plant populations should be mapped to at least 3 meter accuracy, and their locations should be incorporated into a shapefile that will be provided to MNAP. Single plants or small, discrete populations should be mapped as points, to be taken as a circle with a radius of ca. 3m. For larger populations, the boundaries of the population should be mapped. It is understood that within the boundaries, the population of a particular species can vary from relatively dense to relatively sparse.

6 - Field surveys should be conducted as "meander searches". This involves walking a stretch of ROW or proposed ROW twice; generally walking down one side a certain distance and walking down the other side when returning. Also, the surveying botanist should walk in a zig-zag pattern to ensure adequate coverage of the ROW, particularly in areas with moderate to high

potential of harboring rare plants. Ideally surveys should be conducted between June 1st and October 1st.

7 – We recommend documentation of features include completion of MNAP survey forms for rare plants and natural communities (another topic for a meeting with the field consultants). Forms should include at least basic status information for the identified feature, including for rare plants some indication of the population size, its geographic area, its condition (flowering , fruiting, vegetative), and evidence of disturbance. For natural communities the form information should include dominant species, approximate size, and evidence of disturbance. Both forms also need basic information including name of observer, date of survey, town etc. Features documented on forms should be assigned some unique identifier that correlates with the features in the shapefile or on paper maps. Quality ranking on forms will be completed by MNAP staff.

MEETING MINUTES
NECEC USFWS Update and Section 7 Process Meeting

***Contact**:* *Mark Goodwin*
***Title**:* *Environmental Manager - Burns & McDonnell*
***Date**:* *June 1, 2018*
Time: *1:30pm-3:00pm*
Location: *CMP General Office, Augusta*

Attendees:
Gerry Mirabile- CMP
Mark Goodwin- Burns & McDonnell
Lauren Johnston- Burns & McDonnell
Jay Clement- USACE
Wendy Mahaney- USFWS
Melissa Pauley- USDOE (via phone)
Discussion: Mark Goodwin provided a high level project update to the group.

Landscape Analysis

- Burns & McDonnell has nearly completed a landscape analysis for rare plants and unusual natural communities. The protocol for this analysis was developed in consultation with Kristen Puryear (MNAP) and Mark McCollough (USFWS).
- Habitat modeling for the small whorled pogonia was used as part of the landscape analysis.
- Cover type data from Weyerhaeuser was also inputted in the analysis. The data covers portions of Segments 1 and 2 but does not include the entire project corridor.
- The cover type data may be useful for the Canada lynx assessment.
- The results of the landscape analysis and survey locations will be provided to MNAP and USFWS for review and comment.
- Field surveys will start soon after the approved landscape analysis results.
- Wende asked if contractors who will be bidding on the field survey scope of work can provide their experience relevant to searching for the small whorled pogonia.
- Jay asked if there were other landowners along the Project route that could provide cover type data to fill in data gaps. Mark indicated that Burns & McDonnell is still assessing those data gaps.

Biological Assessment

- CMP is willing to proceed with the draft Biological Assessment (BA), however USACE has not given notice to proceed with this task.
- Jay confirmed that the USACE would like CMP/BMcD to proceed in drafting this document.
- Wende asked Jay to confirm in writing that the USACE is the lead action agency for NECEC. Melissa agreed that the USACE will be the lead action agency.

- The BA is a USACE document, but CMP/BMcD will prepare the draft on the USACE's behalf.
- Mark stated that BMcD has reviewed the Corps and USFWS BA templates and they differ slightly.
- Jay stated that we should use the Corps template, however it is a loose format and the document should "hit the major points."
- Jay will assist with the BA table of contents and scope review. Jay noted that BA should in general include a solid description of the project and habitats; project components; and effects analysis.
- Wende stated "Do not waste time regurgitating the biology of the species. Focus on the effects of the Project on species and their habitat. Focus on things that are pertinent." She asked that BA focus on threatened and endangered species and their habitat.
- Wende also stated that USFWS does not need to review the draft versions of the BA. The Corps will submit the final version to USFWS. USFWS is happy to answer biological questions as BMcD prepares the draft.
- Melissa Pauly said the DOE would be focusing their review on what is occurring at the border crossing and that the DOE does not have BA template. She also stated that the DOE is willing to review the draft document.
- Wende stated that migratory birds do not need to be included in the BA.
- Wende discussed that decisions may be coming for the Yellow-banded bumble bee and the Brook Floater, however she does not recommend including them in the BA.
- Mark agreed to circulate BA outline draft.

Species Discussion

- BMcD re-ran USFWS's IPAC for an updated RTE species list. The updated report did not result in any changes to the species the Project may impact.
- Northern longeared bat (NLEB)
    - The Project will utilize the Section 7 streamlined consultation form for the NLEB.
    - Wende instructed CMP/BMcD to put a paragraph in the BA that discusses impact numbers (forest conversion), schedule, and the time of year restriction and include the streamlined consultation form. Wende also instructed us not to do an effects determination for NLEB, and to relate clearing and construction plan to NLEB standards.
    - Jay stated that the form requires updated clearing figures.
    - Jay stated that the standard best management practices (BMPs) for the NLEB include: No clearing from June 1 to July 31, and clearing in the winter, if possible.
    - The Corps will need to understand to what degree the Project can meet these two basic BMP's.
    - Jay stated that the "No clearing from June 1 to July 31" standard is the priority.
    - Mark stated that CMP/BMcD will evaluate the construction schedule and discuss in the BA.

- Mark noted that we have observed that a more restrictive, broader "No Cut Season," April to October, has been imposed on other projects. Wende and Jay stated that if they do require a more restrictive "No Cut Season," then it would be based on the BA.
- Jay would also consider information as to why the broader "No Cut Season" is a burden or not reasonable for the Project.
- Wende said that CMP/BMcD should discuss whether CMP can focus on winter clearing in the greenfield portion of the Project. She indicated that clearing of the greenfield is more of a concern than widening existing corridors since bats tend to roost in forest interiors.
- Wende stated that CMP/BMcD "should not spend 10 pages on the effects determination," and that the BA will have a "may affect" finding because the Project will be clearing trees.
- An updated streamlined consultation form should be sent annually for the duration of tree clearing activities. The form should be resubmitted within 1 year of the date of the form and the acreage to be cleared should be adjusted based on the remaining clearing acreage.
- Jay stated that whatever CMP commits to in the BA to make sure that the Vegetation Clearing Plan (VCP) and vegetation maintenance plans are consistent.
- Wende discussed a lawsuit ruling on the 4(D) rule is expected to be coming in July 2018, however the Project should proceed as is and if something changes, we'll adjust.

- Canada lynx
  - Wende stated that a portion of the project is within critical lynx habitat, and the habitat review for the lynx should address the Distinct Population Segment (DPS) Critical Habitat as well the broader Section 7 review area which extends from the Canadian border to a point in Embden.
  - Wende discussed using stand maps vs aerial photography to assess suitable habitat. She stated that Mark McCollough prefers using aerial photography only since stand maps can be inconsistent. It was acknowledged that stand maps, if consistent, can be useful to identify stands of softwood and mixed softwood.
  - Wende indicated that Mark M. will likely want to be involved during the analysis. BMcD will reach out to Mark M. for guidance.
  - Wende asked if BMcD can visually represent the stand data for Mark M. to review. Once BMcD fully reviews the data, this will be provided in some format.
  - Areal coverage of preferred lynx habitat will be the basis for effects analysis.
  - Jay asked if there have been any good lynx effect analysis done for other projects that USFWS can share. Wende indicated there have not been many projects of this size. Melissa does not know of anything recent enough to reference.
- Atlantic Salmon
  - The Project does not propose any in-stream work, so no direct effects on salmon are anticipated. The approach regarding salmon streams will be identical to how MPRP was constructed.

    - BMcD confirmed that the NECEC waterbody crossing table identifies whether streams are intermittent or perennial, as well as whether the feature is within the Gulf of Maine Distinct Population Segment and/or Atlantic Salmon Habitat, as identified by the Maine Department of Marine Resources.
    - Wende stated that she "hopes we are doing a more conservative buffer," in reference to the currently proposed 25 foot buffer. She also stated that she expects "pole placement is not within the buffer."
    - The BA should include the type of stream crossing proposed and erosion control approach. Typicals of these methods should be included as well, as well as narrative description and anticipated impacts and how impacts will be avoided and/or minimized.
- Eagles
    - Eagle nest surveys will be conducted during construction years; surveys need to be coordinated with USFWS and MDIFW. Need to inventory all nests within 660 feet of corridor.
- Biological Assessment (continued)
    - Overall, the BA should include a detailed construction plan specific to each T&E species concerns. Discuss erosion controls, refueling, restrictive construction practices. While these standards are already in the application and in CMP's Environmental Guidelines, USFWS would like it all in one place, species specific, and "in a nice little package." Wende requested that the BA doesn't reference back and forth to multiple documents.
    - Wende stated that she is not expecting to write a Biological Opinion (BO) in response to the BA. She will likely write a concurrence or disagreement letter on BA conclusions and ACOE proposed permit conditions. They typically do not do "concurrence with conditions."
    - Wende wants the BA to be "explicit with all avoidance and mitigation measures."
    - If at any time, BMcD/CMP are not sure of the effect there can be a discussion with the Corps and USFWS.
    - Formal Section 7 consultation is triggered by any "take" or "adverse effect" On RTE species. Cumulative impact assessment is not required unless formal consultation is triggered.

MEETING MINUTES
NECEC MDIFW State-Listed Species Working Session

***Contact**:* *Mark Goodwin*
***Title**:* *Environmental Manager - Burns & McDonnell*
***Date**:* *June 4, 2018*
Time: *10:30am-1:00pm*
Location: *CMP General Office, Augusta*

Attendees:
Gerry Mirabile- CMP
Mark Goodwin- Burns & McDonnell
Lauren Johnston- Burns & McDonnell
John Perry- MDIFW
Robert Stratton- MDFIW
Charlie Todd- MDIFW
Phillip deMaynadier-MDFIW

General Discussion: The meeting was structured as a working session with MDIFW to review and discuss the Project's impacts to State Listed Species and Species of Special Concern as well as, MDIFW's recommendations outlined in their March 15, 2018 Environmental Permit Review Comments. The meeting began with a safety moment and introductions and proceeded through the agenda (attached).

<u>Northern Bog Lemming</u>

- MDIFW identified approximately 1.5 miles of corridor (Skinner Twp – near West Branch Road) with potentially suitable habitat within Project corridor for survey.
- CMP intends to complete this survey in June, at the latest July.
- CMP will survey the identified area for suitable habitat and conduct a more intensive search in areas which meet those features.
- Mark Goodwin asked if there was a survey protocol available. Charlie Todd stated he will provide some additional information. He also indicated that the agency is willing to assist with survey efforts if something "suspicious" is found and warrants a closer look. He suggested that a contractor may be available to assist.
- Charlie Todd recommended collecting fecal samples to confirm DNA of the Northern Bog Lemming. It is common to find evidence of the Southern Bog Lemming and DNA is the only known way to positively confirm presence.
- Charlie Todd recommended that survey take place toward late summer or early fall, however, surveys could be conducted earlier with possible follow-up surveys occurring in high probability areas. Looking for runways, green pellets, and latrines, and would require field notes and photo documentation.
- There are 4 known locations in Maine of the Northern Bog Lemming.

- MDIFW asked if CMP will contract with a small mammal biologist for these surveys. Mark Goodwin stated that Burns & McDonnell has a biologist in the CT office, with possible support from the Maine office. MDIFW recommended that someone from their department, possibly Bob Cordes and/or Sarah Boyden, assist in survey efforts.
- A question was posed by CMP regarding avoidance and what other considerations there may be other than complete avoidance. It was mentioned that the pole spans are 1,000 feet apart, however, clearing will still need to occur.
- Charlie stated that CMP is unlikely to find the Northern Bog Lemming based on what is known about the species, "highly fragmented remnant population." If CMP finds green scat, then there will be a step of validation through scat collection for DNA sampling. MDIFW and Zach Olson (University of New England) will provide protocols for DNA sampling. CMP inquired about the sampling turn around time.
- John Perry discussed possible avoidance by shifting the transmission line from one side of the corridor or the other, completely spanning the wetland, or designing taller structures to allow for taller capable vegetation to grow. Gerry Mirabile explained that shifting the line within the corridor would likely require additional angle structures and additional impact and referred to the response provided by CMP to MDEP on March 29, 2018, as part of their data request response.
- Phillip deMaynadier inquired about the "level of effort" which would be conducted during the survey and suggested that the level of experience of the surveyor would have variable results. Mark Goodwin stated that a more intensive search would occur in areas exhibiting potential habitat and within/adjacent to wetland areas.

<u>Roaring Brook Mayfly and Northern Spring Salamander</u>

- Burns & McDonnell identified 64 waterbodies that may contain mayfly or salamander habitat. The potential habitat areas are located between the Canadian border and Johnson Mountain Twp.
- The 64 streams were identified using desktop tools, which included looking at streams over 1,000 feet in elevation and reviewing field surveyed features on the data forms for streams with cobble/gravelly bottoms.
- Phillip deMaynadier stated that Beth Swartz (MDIFW) also conducted a desktop review and identified 30-40 features. Mark Goodwin stated that MDIFW's results are consistent with Burns & McDonnell's since some features included in the initial count will need to be visited to confirm presence of potential habitat (note, CMP later performed habitat characterizations on 78 perennial streams in July 2018, and intends on providing this data to MDIFW).
- Phillip suggested that areas which are dominated by softwood could help pare down the features with potential habitat.
- Phillip stated that Beth Swartz provided protocols for mayfly and salamander surveys and it is recommended that the surveyor is a qualified entomologist (mayfly) or herpetologist (salamander). Phillip stated he has a couple of people in mind with good rates, specifically Trever Persons (Norridgewock) as herpetologist and Steve Biryon (UConn) as field entomologist.

- Mark Goodwin discussed the September survey timing for the mayfly as an obstacle for the project permitting schedule. Mark stated that CMP can not meet all the management guidelines provided by MDIFW. Specifically, CMP can not meet the 2nd and 4th bullet in MDIFW management guidance document.
- Mark stated that during the MPRP, CMP and MDIFW executed a Memorandum of Understanding (MOU) for the Black Racer snake which allowed MDFIW to make a determination prior to the development of an Incidental Take Plan (ITP).
- Phillip deMaynadier suggested the concept that Mark laid out "makes sense" and a "streamlined ITP" could be developed for these species. The MOU could state that a "species specific mitigation plan would be forthcoming."
- Bob Stratton suggested that CMP must go through an "avoidance and minimization discussion" to show why CMP can not meet the management standards. Mark Goodwin stated that CMP will provide that discussion in the response to the March 15th letter.
- Gerry Mirabile explained the public hearing and timing concerns to the group and why CMP is seeking a determination prior to the survey. He explained that CMP intends to conduct the survey, however, the MOU would allow the MDIFW to make a determination prior to the September survey.
- Phillip deMaynadier indicated that the Northern Spring Salamander was likely to be found within the Project areas and indicated that CMP could conduct those surveys prior to September. The Northern Spring Salamander is a Species of Special Concern in Maine and an ITP wouldn't apply but CMP could form a similar mitigation measures plan for this species. Phillip stated that CMP could use the same MOU model for the salamander and mayfly; formal ITP is available for the mayfly since this species is listed as "threatened."

<u>Riparian Buffers</u>

- Bob Stratton stated that MDIFW is going to be asking for 100 foot stream buffers.
- John Perry asked "what can we get for buffers?"
- Gerry Mirabile wanted clarification of what MDIFW considers "buffers."
- John Perry indicated that cutting capable species and leaving the understory is the practice they would be looking for. Gerry Mirabile stated that often in a practical scenario, there may initially be no understory after the forested canopy is removed.
- John Perry discussed that increasing pole heights and decreasing span lengths might allow for leaving the buffer intact.
- Gerry Mirabile discussed that increasing the pole heights increases the visual impact.
- MDIFW noted they are looking for temperature shading for cold water fisheries.
- MDIFW would like an idea of the impact and which standards CMP can and cannot comply with as part of the response to the March 15 MDFIW comments.
- Gerry stated that the width of the buffer is less critical to CMP than the management practices within the buffer.

- It was mentioned that activities in the buffer are temporary and impacted during initial clearing. The corridor is allowed to revegetate immediately after construction and will be maintained as early successional, scrub-shrub habitat.
- Phillip noted that there is not a "one size fits all" with buffers.

Wood Turtles

- The time of year restriction (TOYR) for the Wood turtle was clarified: April 15 to Oct 15.
- Wood turtle habitat was identified by MDIFW in Segment 5. Clearing activities in this portion of the Project primarily consists of mowing of existing vegetation and some limited tree clearing.
- CMP intends to meet the TOYR for clearing, however the restriction on construction activities may be harder to meet.
- Mark Goodwin asked if there could be flexibility allowed if the access roads were installed outside of the April to October time period, then construction can occur within the TOYR window if all travel were restricted to matted/established access roads and work pads.
- Proposal is to mow or clear October 15 to April 15, and to construct on mats (in habitat areas) April 15 to October 15.
- It was mentioned that turtles can still get crushed on the mats.
- Suggested ideas were to have a spotter walk through prior to daily construction travel and/or installation of silt fence to keep the turtles out of the travel ways.
- Mark Goodwin noted that he emailed Derek Yorks of MDIFW, requesting the location of the 16 identified streams (1 confirmed presence, 15 potential). MDIFW will provide a shapefile or a list of the stream ID's for BMCD.

Golden and Bald Eagle

- MDIFW confirmed that they are conducting a 2018 eagle survey.
- Charlie Todd stated that they had not yet flown the Upper Kennebec River.
- CMP stated they would do surveys annually prior to construction in areas slated for construction during that year.
- The TOYR is typically within 660 feet of an identified, active nest.
- CMP noted that it would install avian markers as required by MDIFW.

Great blue heron

- Prior to clearing, CMP will conduct surveys within identified IWWH.
- Survey timing of heronries don't coincide with eagles. Surveys should be conducted in June.
- If a heronry was found, CMP asked what would the TOYR be? MDIFW responded that a TOYR may be required that allows no work within IWWH containing nests that are active (eggs or chicks).
- MDIFW suggested that CMP mitigate or compensate for cutting down a heron rookery..

Brook Floater Mussel

- No instream construction in 2 known locations (Carrabassett River and Sheepscot River).
- CMP noted no clearing planned within 250 feet of these rivers.
- MDIFW noted that it would be a "good faith" compensation to rebuild riparian zone via purchasing agricultural rights in these areas and allowing to regrow to trees to provide shade.

Bats

- MDIFW March 15 comments indicated that there will be no significant Project impact to bats.
- CMP intends to comply with the June 1 to July 31 TOYR on clearing activities for the Northern Long Eared Bat. CMP is anticipating that the USFWS may recommend an April to October TOYR for the greenfield portion of the project.
- MDIFW suggested that acoustic monitoring may enable CMP to work within a lesser TOYR.

Significant Vernal Pools

- MDIFW received CMP's list December 2017; CMP updated list based on MDIFW feedback on pool status.
- MDIFW requested that latest data be provided to Beth Swartz as soon as possible. Lauren agreed and noted that table will be modeled after MDIFW's example.
- Lauren noted that there are 80 to 90 significant vernal pools within the entire project.
- Group discussed 40% discount on SVP ILF (Mike Mullen/NDEP 2017 letter).

Coldwater Fisheries

- Mark Goodwin suggested that mitigation options could include "lop and drop" and culvert replacements.
- Bob Stratton returned to the 100 foot buffer request and stated that structures should also be set outside riparian buffer, and reiterated the goals of avoiding and minimizing impacts to fisheries.
- Bob Stratton explained that MDIFW defines buffers as "forested buffers, not necessarily vegetated."
- MDIFW stated that CMP will need to demonstrate why they cannot meet these standards.
- Bob Stratton wanted to know why CMP can not move the line to avoid resources.
- Gerry suggested scheduling a follow-up meeting with CMP's vegetation management group.
- John Perry suggested having an engineer at the follow-up meeting to discuss limitations on design with respect to natural resource avoidance; CMP agreed.

Asali, Natasha

From: McCollough, Mark <mark_mccollough@fws.gov>
Sent: Tuesday, June 19, 2018 8:15 AM
To: Goodwin, Mark
Cc: Puryear, Kristen; Desson, Leonard R (Len); Mirabile, Gerry J. (Gerry.Mirabile@cmpco.com); Hoodlet, Sarah
Subject: Re: [EXTERNAL] NECEC Landscape Analysis Shapefiles

Follow Up Flag: Follow up
Flag Status: Completed

Mark:

I am fine with your approach for small whorled pogonia.

Thanks, Mark McCollough

On Fri, Jun 15, 2018 at 11:10 AM, Goodwin, Mark <magoodwin@burnsmcd.com> wrote:

> Good morning Kristen and Mark:
>
> Please find the attached zip file containing the data sources for unique habitat features that were evaluated as well as the survey blocks proposed for rare plant surveys. The survey blocks should display in two different colored feature types (proposed survey blocks in purple and random survey blocks in yellow). As I noted in my email to Kristen earlier this week, of the 75.4 miles of corridor on Segments 1 & 2 (Canada Border to Wyman Hydro), 49 miles (65%) have been identified for field investigation. As a result, 26.35 miles of corridor are not recommended for field survey. We plugged in the random survey areas, however many of these areas would be walked through to access the proposed survey areas and if unique habitat features were observed the surveyors would spend more time in those areas anyways. Please let me know if you feel the proposed survey areas are adequate and if any areas should be added or eliminated.
>
> In regards to the small whorled pogonia, nearly all areas identified by the habitat model in Segment 3 of the project will be searched.
>
> We are waiting for the proposals from qualified rare plant surveyors and anticipate receiving them next week. We will share the names of the selected consultant(s) at that time.
>
> Please let me know if you have any questions or have any issues viewing the attached information.
>
> Thank you,

Mark Goodwin, CPESC \ Burns & McDonnell

Senior Environmental Scientist

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Mark McCollough, Ph.D.

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Asali, Natasha

From: Mahaney, Wende <wende_mahaney@fws.gov>
Sent: Thursday, September 6, 2018 7:32 AM
To: Clement, Jay L CIV USARMY CENAE (US)
Cc: Goodwin, Mark; Melissa.Pauley@hq.doe.gov; Mirabile, Gerry J. (Gerry.Mirabile@cmpco.com); Johnston, Lauren A; Morin, James; McCollough, Mark
Subject: Re: [EXTERNAL] RE: NECEC Biological Assessment Draft TOC

Follow Up Flag: Follow up
Flag Status: Flagged

Jay - Thanks for looping us in. I agree with your comments and reiterate that the description of the proposed action should ideally include a clear description of all proposed conservation measures that will avoid and minimize impacts to listed species and critical habitat. Generally for a Corps' BA, this includes a list of proposed permit conditions. Not sure how DOE usually approaches this. We can have further discussion on this point if needed. Although I'm not sure that we've really delved into ideas about effects determinations yet in a formal way (no pun intended), if we do need to do a formal consultation for any species, ideally the proposed action would incorporate all conservation measures up front such that the incidental take statement doesn't need any terms and conditions other than monitoring/reporting.

Jay is also correct that you don't need to spend pages and pages regurgitating general species biology, descriptions of habitat etc. Summaries that FOCUS on what is relevant to the expected impacts of this project on the species and their habitats should be sufficient.

Above all else, the most important aspect of the BA is a clear and comprehensive project description that includes sufficient details on all aspects of the proposed action from construction to long-term operation and maintenance. If we don't get this part of the BA really top-notch, then problems can just cascade throughout the document as I'm sure you all know!

As you'll see from Mark's email, he is out of the office until September 20.

If there are any questions or need to further clarification, don't hesitate to ask. Glad to discuss things by phone.

Thanks, Wende

Wende S. Mahaney, C.W.B.
U.S. Fish and Wildlife Service
Maine Field Office
P.O. Box A (mailing address)
306 Hatchery Road (physical address)
East Orland, Maine 04431
Telephone: (207) 902-1569 (direct line)
Fax: (207) 902-1588
Cellular Phone: 207-944-2991

On Wed, Sep 5, 2018 at 7:30 AM, Clement, Jay L CIV USARMY CENAE (US) <Jay.L.Clement@usace.army.mil> wrote:

Mark:

I'm looping Wende and Mark into this because I'd like their input too. My comments at this point are limited:

Front cover - add DOE to this undertaking as well.

As you describe the species and its status, don't spend a lot of time regurgitating reams of background, keep to a summary format. I say this based on past guidance from Wende who has repeatedly reviewed the same background information on salmon time and time again. I expect Mark is the same. It's my understanding they don't need to see it in huge detail again.

As you discuss effects of construction and operation, be sure to describe the mitigating effects, if any, of various BMPs, e.g. no cut buffers on salmon streams.

Jay

-----Original Message-----
From: Goodwin, Mark [mailto:magoodwin@burnsmcd.com]
Sent: Tuesday, August 28, 2018 11:10 AM
To: Clement, Jay L CIV USARMY CENAE (US) <Jay.L.Clement@usace.army.mil>; Melissa.Pauley@hq.doe.gov
Cc: Mirabile, Gerry J. (Gerry.Mirabile@cmpco.com) <Gerry.Mirabile@cmpco.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Morin, James <jmorin@burnsmcd.com>
Subject: [Non-DoD Source] NECEC Biological Assessment Draft TOC

Jay/Melissa:

As requested during our meeting earlier this summer, please find the draft Table of Contents for the NECEC Biological Assessment for your review and comment. Note that the TOC in the final document will be formatted a little differently and will include reference to tables and figures, but for the purposes of Corps and DOE it should be easier for you to review and comment using the attached format.

Note we have already started drafting the BA and will continue to do so. We'll make any tweaks necessary based on your comments.

Thank you,

Mark Goodwin, CPESC \ Burns & McDonnell

Senior Environmental Scientist

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MEETING MINUTES

MNAP – Rare Plant Locations, Avoidance/Minimization

***Contact**:*	*Mark Goodwin*
***Title**:*	*Environmental Manager – Burns & McDonnell*
***Date**:*	*October 3, 2018*
Time:	*10:00 am -12:15 pm*
Location:	*MNAP Office, 17 Elkins Drive, Augusta*

Attendees:

Gerry Mirabile (GM)- CMP
Mark Goodwin (MG)- Burns & McDonnell
James Morin (JM)- Burns & McDonnell
Kristen Puryear (KP)- MNAP
Molly Docherty (MD)- MNAP
Don Cameron DC)- MNAP
Jim Beyer (JB)- MDEP
Mark McCollough (MM)- MDIFW

Purpose:

Meeting to discuss avoidance and mitigation measures for rare plants and unusual natural communities which may be impacted by CMP's NECEC Project.

General Discussion:

The meeting began with a quick review of the intended goals of the meeting which were to discuss the locations of rare plants and unusual natural communities identified within CMP's corridors as a result of the NECEC rare plant and exemplary natural community field survey; to discuss agency concerns regarding each species/community; and to determine the appropriate level of avoidance (if required), mitigation, or best construction practices for each occurrence.

Rare Plant Occurrences:

Isotria medeoloides (Small Whorled Pogonia [SWP])

- MG showed on Google Earth where the SWP was recently identified; within CMP corridor but outside the current project's clearing limits in Greene.
- MG estimated that the SWP location was about 12' outside the proposed clearing limits.
- MM had questions about the extent of the survey area, inside and outside the clearing limits, and the name of the abutter.
- GM asked about the shade tolerance of the SWP and the intrusion of additional sunlight.
- DC stated that any amount of tree clearing could potentially imperil the occurrence and that when the canopy is removed there is first the impact of additional light changing the

microclimate and second, dense early successional growth that would result could change the habitat conditions, altering the habitat so that it is unsuitable for SWP.

- JB asked if planting additional non-capable species along the edge of ROW would be appropriate.
- DC stated there was no guarantee that planting non-capables would be sufficient to protect the occurrence and that plantings to mitigate impacts to SWP is something that is not done.
- GM spoke about changing the wire configuration from horizontal to vertical in this area to minimize the amount of clearing.
- MM asked about the separation zone between the edge of ROW and the wire.
- GM spoke about the line clearance requirements and the potential for outages and fines (financial penalties) if the appropriate clearance is not maintained.
- GM spoke about reconfiguring the adjacent lines to make more room for the new line in a manner that would avoid tree clearing in this location.
- MM asked about managing trees to a mid-canopy height (topping) to provide shade.
- GM spoke about a maximum height of 10' under the wire zone, capable vs. non-capable, and that some species are better suited to top verse others. Managing the vegetation in this manner is doable but not preferred for a variety of safety, reliability, and environmental reasons.
- DC stated that managing the clearing limits as mid-canopy could not guarantee survival of the occurrence.
- GM asked the group about the possibility of transplanting.
- DC stated that was not practical (due to SWP's association with fungus and trees), MD concurred that transplanting was not an option.
- GM asked if construction of a shade pergola over the occurrence would sufficiently mitigate for clearing.
- MD and DC concurred that this was not a guaranteed or preferred method of preservation.
- MG said that discussions with project engineers was necessary to determine if re-aligning the wires and the adjacent (co-located) transmission lines was an option.
- GM asked if reconfiguring the line and the adjacent lines was not an option that what would be the next step.
- DC and MM agreed that conservation of an adjacent population if present on the abutters land could be a viable mitigation measure. Additional surveys on abutting land would be needed to determine whether or not that option was viable, but time is running out to do so in 2018.
- GM asked the group about additional mitigation measures.
- MM indicated that anything other than avoidance would trigger formal consultation under Section 7 of the Endangered Species Act, and that to authorize a take, USFWS would require a thorough vetting of alternatives, avoidance, and mitigation in the context of a Biological Assessment. USFWS would then issue a Biological Opinion within 130 days.
- GM spoke about the project timeline and that hearing would likely be 3rd week in January 2019.
- JB spoke about possible permits issued by Mar./Apr.
- GM spoke about a project construction start date of Nov/Dec 2019 with an in-service date of late 2022.

- Final thoughts included additional survey efforts outside CMP corridor on abutters property (with landowner permission), mitigation measures, fall back to mitigation measures, and engineering alternatives with re-alignment of adjacent lines to make room for the new line without additional clearing.

Gentiana rubricaulis (Red-stemmed Gentian)

- DC stated that this plant does well in open rights-of-way. Appropriate protection includes flagging all populations prior to construction, clearing during frozen ground conditions or on matted travel lanes.
- MG explained that all protected natural resources would be flagged/signed prior to construction, would be maintained throughout construction, and that environmental inspectors and third-party inspectors monitor the condition of flagging/signage throughout the project.

Dryopteris goldiana (Goldie's Wood Fern)

- DC stated that this was a canopy dependent special concern species, and that it was important to maintain as much shrub growth in the vicinity as possible and that survey of existing undergrowth would be beneficial.
- Population is located approximately 20 feet from the outside edge of the clearing limits in a riparian area.
- MG stated that a riparian buffer with taller non-capable vegetation outside of the wire zone would be maintained and that hand cutting could be implemented within proximity to the occurrence to prevent heavy equipment impacts.
- DC indicated that being in a hydric regime (proximity to stream and wetlands) would likely mitigate the impacts of canopy disruption for this occurrence.

Carex siccata (Dry-spike Sedge)

- All agreed that these populations are likely to not be impacted by construction activities.
- DC stated that flagging and avoidance to the extent practical will be sufficient.
- MNAP noted that poles to be removed should be cut at ground level, soil added, and areas allowed to revegetate.
- DC requested that if disturbance occurs within this habitat, the disturbed area should be raked out (Note: CMP will mulch all disturbances within rare plant species habitat with weed-free straw).

Houstonia longifolia (Long leaved Bluet)

- DC stated that this population has been present for quite a while and that flagging the occurrence prior to construction for avoidance and to verify the correct placement of the access road will be sufficient to protect the species.

Trichophorum clintonii (Clinton's Bulrush)

- DC stated that this plant prefers open areas (e.g., ROWs) and that flagging and avoidance of the population will be sufficient.

Galium kamtschaticum (Boreal Bedstraw)

- Occurrences are outside of the project ROW and will not be impacted by construction.

Lindernia dubia var. anagallidea (Yellowseed False Pimpernel)

- DC stated that this plant prefers open areas. All agreed that flagging, hand cutting of vegetation and protection of basin where this occurrence is, would be enough to protect the species.

Natural Community Occurrences:

Jack Pine Forest

- KP stated that this forest is a very rare natural community in the context of its location in northwest Maine and questioned how big the population may be, and how far outside the CMP ROW the community can be found. KP stated that it appeared that 18 acres of the community was mapped in the 300-foot-wide corridor. The extent of the impact may be mitigated by the overall size of the community (Note: clearing within Jack Pine community is approximately 5.5 acres).
- MNAP noted that the purple lesser frittilary, a rare butterfly, may be present here.
- KP stated that clearing impacts may reduce the condition/quality of the community, may lower the rank.
- DC spoke about the need to know the extent of the stand (complete polygon size) and that MNAP needed to and would gather more ground information.

Hardwood River Terrace Forest (Basswood/Ash/Red Maple Forest) – Livermore Falls

- KP stated that there is not much knowledge about this specific forest stand and that it appears it does not meet the minimum standards for the Hardwood River Terrace Forest natural community type because it is degraded and below MNAP mapping size criteria.
- MNAP noted that this may be wood turtle habitat.
- MNAP indicated that avoidance/mitigation was not necessary.

Hardwood River Terrace Forest – Anson

- KP questioned if there was minimal clearing compared to the larger mapped polygon.
- KP stated that it appears to be a young forest with significant invasive plant species based on the recent Gilman and Briggs survey.
- MD asked about the current rank.
- DC stated that to determine rank MNAP would have to do a more comprehensive ground survey to see the extent of the forest community.

- No avoidance or minimization measures were recommended.

Enriched Northern Hardwood Forest – Moxie Gore

- KP stated that it would be beneficial for MNAP to do a more comprehensive ground survey to see the extent and quality of the forest community.
- DC spoke about the need for more ground survey information to put the project clearing in context to the larger mapped community.
- MD spoke about the need for landowner permission.

General Note: MNAP commented that one of the minimization measures for all rare plant and natural community occurrences should be the implementation of an invasive species control plan. MG indicated that CMP intended to develop a pre-construction survey and post-construction monitoring and treatment plan like that implemented on the Maine Power Reliability Program. MNAP noted that if RTE plant surveyors did not observe invasives in greenfield, pre-construction invasives survey was not necessary.

MEMORANDUM OF CONVERSATION

Client: *Central Maine Power Company*
Project: *New England Clean Energy Connect*
***Contact**:* *Mark McCollough*
***Agency**:* *United States Fish and Wildlife*
***Date**:* *11/16/2018*

Discussion: Voicemail Message to Jim Morin by Mark McCollough regarding Canada Lynx

Mark left me a voice message at 1:01 PM on Nov. 15, 2018

To determine the southern extent of my desktop habitat analysis, Mark wanted me to ask the MDIFW for any new track data for the last few years in the towns south of the Section 7 review area. The southern most lynx occurrence data would determine the limit of my desktop habitat analysis.

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

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

December 7, 2018

Gerry Mirabile
Central Maine Power
83 Edison Drive
Augusta, ME 04660

Mark Goodwin
Burns & McDonnell
27 Pearl Street
Portland, ME 04101

Via email: Gerry Mirabile, Mark Goodwin, Lauren Johnston, Jim Byer, Molly Docherty

Dear Mr. Mirabile and Mr. Goodwin,

The Maine Natural Areas Program (MNAP) has received and reviewed Central Maine Power Company's (CMP) summary of proposed avoidance, minimization, and mitigation measures for rare plants and natural communities within the NECEC project, as well as the Compensation Plan submitted to the Maine Department of Environmental Protection and U.S. Army Corps of Engineers on October 19, 2018. Although many of the potential impacts to rare botanical features have been addressed, our review notes outstanding concerns. In particular our concerns center on 1) a need for additional explanation of avoidance and minimization of impacts to specific rare features, 2) CMP's proposed compensation for natural community impacts, and 3) a confirmation of language on invasive plant monitoring and management. Please see an explanation of these concerns and questions, below.

Small whorled pogonia (*Isotria medeoloides*):
As discussed at our meeting on October 3rd, 2018, forest clearing associated with the right-of-way adjacent to the occurrence of small whorled pogonia would potentially imperil the population and permanently alter supporting habitat. On November 13th, 2018 Mark Goodwin provided MNAP with a revised map showing a CMP-engineered solution that would avoid any additional forest clearing near the plant. It appears that the realignment of the Project Centerline and elimination of associated clearing will avoid any project-related impacts to the documented small whorled pogonia occurrence.

MNAP recommends that as with other occurrences of the federally listed small whorled pogonia, this site be periodically monitored by the MNAP botanist or qualified botanist as approved by MNAP or USFWS. We recommend the site be surveyed once a year for the first three years

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM

DEPARTMENT OF Agriculture Conservation & Forestry

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after implementation of the project. Thereafter we recommend the site be monitored once every three years, which is the current monitoring frequency for this species at other sites in Maine. Monitoring will cease if no small whorled pogonia plants are found at the site for three consecutive surveys.

Goldie's Wood Fern *(Dryopteris goldiana)*
Goldie's wood fern is a Species of Special Concern in Maine, with a State rarity rank of S2 (imperiled). As stated during our meeting on October 3rd, 2018, this species is sensitive to canopy disturbance and it is therefore important to maintain as much of the current shading and canopy cover as possible. According to the table in the October 19th, 2018 memo, CMP's proposed Avoidance, Minimization, or Mitigation measures for the occurrence of this species are to "maintain [the] riparian buffer adjacent to this occurrence" and to plant non-capable species. MNAP finds that these actions are insufficient to avoid or minimize clearing-related impacts to the Goldie's wood fern occurrence.

If CMP proposes no alternative avoidance or minimization options, MNAP proposes one of the following possible compensatory measures for impacts to the Goldie's fern occurrence, to be pursued in consultation with MNAP: 1) CMP protection of a documented occurrence of Goldie's fern elsewhere in the state; *or* 2) if no suitable Goldie's fern sites are available then the protection of a site that supports other rare forest-dwelling plant species in the Central and Western Mountains region; *or* 3) CMP funding toward MNAP's rare plant surveys in Maine; *or* 4) another CMP mitigation proposal in support of the conservation of rare plants in the Central and Western Mountains region.

CMP-Proposed Compensation for Impacts to Rare Natural Communities
CMP's 2018 field survey identified three different rare natural community types intersecting the clearing limits of the proposed project. These are Jack Pine Forest (S1), Hardwood River Terrace Forest (S2), and Enriched Northern Hardwood Forest (S3).

1) Jack Pine Forest (S1, critically imperiled)
Please note the tabular list and GIS shapefile with natural communities documented by contractors in 2018 and provided by CMP include three features identified alternatively as Jack Pine Woodland and Jack Pine Forest. The corresponding Observation point/Field Site IDs assigned to those features are JackPineWood004 through JackPineWood006. However, based on MNAP's review of the general descriptions, habitat descriptions, and vegetation by strata recorded on the field forms it appears that all three fit the criteria for a Jack Pine *forest*, not Jack Pine *woodland*.

Jack Pine Forest is an S1 (critically imperiled) natural community, and there is only one other documented occurrence of this rare forest type in Maine. Notably, this previously known occurrence is part of a U.S. National Park Service's National Natural Landmark called *No. 5 Bog and Jack Pine Stand*, located just two miles north. Jack Pine forest is restricted to northern regions (45 degrees latitude and north) and well drained, sandy soils, is extremely limited in its range in Maine, and is thus a unique part of Maine's biodiversity.

2) Hardwood River Terrace Forest – Anson (S2, imperiled)

Hardwood River Terrace Forests are restricted to the slightly elevated terraces associated with low gradient rivers. These natural communities are host to a wide variety of wildlife, often support rare plants, and contribute to a functioning floodplain for water storage and nutrient exchange. A MNAP study found that floodplain forest types are underrepresented on unmanaged conservation land (i.e. land not managed for forest products) in the Central Maine Interior biophysical region (which encompasses Anson) (Schlawin and Cutko 2014). This forest type is also highly susceptible to invasive plants which can result from fragmentation or other disturbance. Notably, when this example of floodplain forest was surveyed in 2007 as part of the Maine Power Reliability Project, a much smaller component of invasive species was present than was found in 2018 by the same surveyor. MNAP mapped the remaining extent of this floodplain forest outside of the CMP corridor in 2016.

3) Enriched Northern Hardwood Forest – Moxie Gore (S3, rare)

Enriched Northern Hardwood forests are closed canopy forests that are typically dominated by species that have an affinity for richer soils. Maine's bedrock and soils are generally more acidic, thus this natural community type is limited by geology and topography and as a result often occurs in small patches where nutrients collect such as coves or the toe of slopes. Yet these rich forests support a diverse suite of species in the canopy and understory that do not grow elsewhere in the state. An MNAP study found that enriched northern hardwood forest is underrepresented on unmanaged conservation land (i.e. land not managed for forest products) in the Central and Western Mountains biophysical region (which encompasses Moxie Gore) (Schlawin and Cutko 2014).

During the October 3rd, 2018 meeting, MNAP recommended that a Staff Ecologist conduct a field survey of these identified rare natural community sites to evaluate their condition and potential extent, assess the impacts of clearing, and evaluate any possible avoidance or minimization of those impacts. On October 19th, 2018 MNAP received the meeting minutes and Rare Plant and Unique Natural Community Avoidance, Minimization and Mitigation summary with no response as to whether MNAP would be granted permission to survey these rare natural community sites. MNAP reiterates our recommendation that these sites be assessed by a Staff Ecologist on the ground.

CMP's October 19th, 2018 Avoidance, Minimization and Mitigation summary to MNAP offers no information as to how adverse impacts to the rare natural community types described above will be avoided or minimized. Attachment A of that summary simply states "unavoidable impact" for all five natural community locations (5 identified CMP polygons) and proposes monetary compensation or "…preservation for significant wildlife habitats if determined necessary and appropriate by MNAP (dependent on community rank)". Yet since MNAPs request to visit these natural communities has not been granted, a community rank cannot be assigned.

The Compensation Plan submitted to MDEP and U.S. ACOE (dated Oct. 19 2018) also does not give any description of avoidance or minimization measures, other than to say in Section 1.2.2.5 that "unique natural communities identified will be impacted by unavoidable tree clearing activities", followed by a proposal that CMP make a $32,400 contribution to the Maine Natural

Areas Conservation Fund or provide 8:1 land preservation. MNAP has concerns with these statements for the following reasons:

1) An adequate description of avoidance or minimization measures for these three natural community types has not been provided;
2) CMP did not provide a rationale or calculation formula / fee structure for the proposed $32,400 contribution;
3) No preservation of equivalent conservation value has been identified or proposed;
4) The proposed compensation of $32,400 would be largely ineffective as monetary support towards the preservation (or restoration and enhancement) of similar natural community examples elsewhere, and therefore would not provide adequate compensation in an ecologically meaningful way. Furthermore, to our knowledge this calculated value does not follow any precedent for the monetary compensation of similarly unique and valuable resources.

The rare natural community types impacted under the current proposal are comparable to S1 or S2 wetland communities (as protected under Wetlands of Special Significance [WOSS]) in their rarity and biological values, and are naturally rarer, more unique, and more restricted even than other WOSS types. Maine's ILF calculations provide accepted fee structures for WOSS that may be applied to determine compensation values of these three rare natural communities. Another accepted compensation standard that provides reasonable analog is that used for calculating impacts to habitat for rare wildlife species, with applied buffers and a 8:1 resource multiplier. A 250' buffer is a valid, often applied standard used for rare animal species, wildlife habitats, and S1/S2/S3 upland natural communities to take into account the direct and indirect impacts of land clearing on a resource (e.g. impacts from light and wind exposure, shifts in microclimate, potential for increased predation or invasive or weedy species, etc.).

As outlined above, there are three natural community types (Jack Pine Forest, Hardwood River Terrace Forest, and Enriched Northern Hardwood Forest) and one rare plant population (Goldie's fern) that will be impacted by this project, and for which CMP has not sufficiently described measures of avoidance and minimization. If CMP can demonstrate that impacts to these rare features are unavoidable, MNAP would be willing to discuss mitigation options that are defensible, have precedent, and will be effective towards an equivalent and ecologically meaningful protection of comparable rare botanical features. MNAP strongly recommends that CMP apply one of the above compensatory approaches in determining the mitigation value for these features. MNAP has calculated the square feet of impacts and applied 250' buffer, provided in the table below.

Natural Community Name	**Proposed clearing impact (ft^2)**	**Clearing w/ 250' buffer (ft^2)**
Jack Pine Forest	257,550.4	3,063,132.8
Enriched Northern Hardwood Forest	122,134.9	819,177.3
Hardwood River Terrace Forest	22,937.2	420,231.2
Total	402,622.5	4,302,541.3

If preservation is ultimately a chosen mitigation option, MNAP strongly recommends that it compensate for impacts to these natural communities or plants by preserving sites of equivalent types in ecologically meaningful ways, and that it be done with consultation and field verification by MNAP.

Non-Native Invasive Plants

Non-native invasive plant species are a significant threat to plant and animal habitat, as well as to forest regeneration, transportation and infrastructure, and aesthetic values. Invasive plants are known to spread along corridors such as cleared right of ways and road shoulders. Maine is fortunate that the northwestern region of the State has a very low frequency of invasive plants relative to other regions, in part due to a lack of fragmentation and development (McMahon, in press). The NECEC-CMP Compensation Plan dated October 19, 2018 does not reference any plan to survey for invasive plants prior to construction of new rights-of-way, nor any plan to treat or monitor for invasives into the future. As was discussed in person on October 3, the development and implementation of an invasive species monitoring and control plan should be part of the minimization measures and should be required as a condition of issuance of the permit. MNAP also recommends that invasive plant monitoring be conducted by a qualified field scientist and that CMP establish a Fund earmarked for the monitoring as well as control.

CMP-Proposed Compensation Plan (submitted to MDEP and ACOE October 19th, 2018)

MNAP has several comments and questions related to the clarity of the CMP-proposed compensation for impacts to rare plants and unique natural communities, as follows:

1) Table 1-1 of the Compensation Plan provides a summary of each of the resource impacts, and the form and amount of compensation. No reference is made to the "Other" impacts category as listed on page 2 of the Compensation Plan, impacts which are listed to include *Impacts to rare plants and unique natural communities*. Impacts to plants and natural communities should be listed in this table.

2) Compensation Plan Section 1.2.1.9 – Compensation of Other Impacts, does not in any way reference or explain how compensation is proposed for impacts to rare plants or rare or exemplary natural communities. However other resources in this "Other" category such as cold water fisheries, DWAs, and Recreational Use of Outstanding River Segments are addressed, to include proposed minimization measures. As noted above there are still points to discuss with regard to specific features, however MNAP requests that the ultimate outcome be described in this section with the other resources in this category.

Minutes from October 3, 2018 – Attachment A comments

This section captures small comments on the NECEC Rare Plant Occurrences and Unique Natural Communities table provided in Attachment A with the minutes from our October 3rd, 2018 meeting. Note more in-depth comments for specific natural communities or rare plants are made in the sections above.

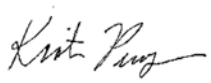
- *Carex siccata* (Dry land sedge): MNAP recommends adding "poles to be removed should be cut at ground level, soil added, and allowed to revegetate" to better capture the comments in the minutes and minimize disturbance.
- *Gentiana rubricaulis* (Red-stemmed gentian): Currently the CMP proposed avoidance, minimization, or mitigation measures generally reflect the recommendations from the October 3rd meeting, however they are inconsistent across the five occurrences of this species listed in the table. MNAP recommends modifying the table so that each occurrence is consistent and includes the following measures – "CMP will flag all

populations prior to construction, clearing should be done during frozen ground conditions or on matted travel lanes, CMP will restrict travel lanes where possible.”.

- *Lindernia dubia var. anagallidea* (slender false pimpernel): MNAP recommends the CMP proposed avoidance, minimization, or mitigation measures include protection of the basin where this species occurs, in addition to the flagging and hand cutting of vegetation only.

I look forward to further discussion. Please contact me if you have any questions or concerns.

Thank you,



Kristen Puryear
Ecologist
Maine Natural Areas Program
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Morin, James

From: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Sent: Thursday, December 27, 2018 5:05 PM
To: Morin, James
Cc: Perry, John; Goodwin, Mark; Stratton, Robert D; Meehan, Amy
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis
Attachments: LynxObsforDataRequest.cpg; LynxObsforDataRequest.dbf; LynxObsforDataRequest.prj; LynxObsforDataRequest.sbn; LynxObsforDataRequest.sbx; LynxObsforDataRequest.shp; LynxObsforDataRequest.shp.xml; LynxObsforDataRequest.shx; DOCUMENTED LYNX OCCURRENCES shapefile for NECEC.doc

Hi Jim,

Attached is the shape file for the Wildlife Management Districts surrounding the project area. We have updated 2 of the 3 sources of data. The 3rd source (credible verified lynx sightings) is current through 2014. We will let you know if there are any additional points within the project area as soon as possible. Please open the word document to learn more about the data sources and the attributes in the attached shape files.

If you have any questions, please feel free to contact me.

Happy New Year!

Jen

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Bangor, ME 04401
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From: Vashon, Jennifer
Sent: Friday, December 14, 2018 2:30 PM
To: Morin, James <jmorin@burnsmcd.com>
Cc: Perry, John <John.Perry@maine.gov>
Subject: Re: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jim,

It appears that Amy had started the update before she left on leave and our GIS staff have advised that we wait until Amy gets back next Weds to send you what has been q/c to date.

I apologize for the delay and we will make every effort to get it to you next week.

All the best,
Jen
Get Outlook for iOS

From: Vashon, Jennifer
Sent: Wednesday, December 12, 2018 3:20 PM
To: 'Morin, James' <jmorin@burnsmcd.com>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Sorry Jim,

I had hoped to get it to you on Friday as this is a very busy week for me. I should be able to work on it on Friday and hope to get it out to you before the end of the day.

Jennifer Vashon
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From: Morin, James [mailto:jmorin@burnsmcd.com]
Sent: Wednesday, December 12, 2018 11:20 AM
To: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Cc: Goodwin, Mark <magoodwin@burnsmcd.com>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jen,

Any update on this request?

Thanks,

Jim

From: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Sent: Tuesday, December 04, 2018 12:31 PM
To: Morin, James <jmorin@burnsmcd.com>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Anna Harris <anna_harris@fws.gov>; Goodwin, Mark <magoodwin@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; McCollough, Mark <mark_mccollough@fws.gov>; Perry, John <John.Perry@maine.gov>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Jay L. Clement - USACOE (jay.l.clement@usace.army.mil) <Jay.L.Clement@usace.army.mil>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi James

With Amy out, I'll work with other GIS staff to get this to you. We will make this a priority and hope to have it to you by the end of the week.

Jennifer Vashon
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From: Morin, James [mailto:jmorin@burnsmcd.com]
Sent: Tuesday, December 04, 2018 11:15 AM
To: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Anna Harris <anna_harris@fws.gov>; Goodwin, Mark <magoodwin@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; McCollough, Mark <mark_mccollough@fws.gov>; Perry, John <John.Perry@maine.gov>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Jay L. Clement - USACOE (jay.l.clement@usace.army.mil) <Jay.L.Clement@usace.army.mil>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jen,

Per your Nov. 21 email, can you send me your "current layer as a starting point".

Thanks,

James P. Morin, LF*, CPESC\ Burns & McDonnell

Sr. Environmental Scientist \ Forester

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jmorin@burnsmcd.com \burnsmcd.com

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From: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Sent: Tuesday, December 04, 2018 10:05 AM
To: Morin, James <jmorin@burnsmcd.com>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Anna Harris <anna_harris@fws.gov>; Goodwin, Mark <magoodwin@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; McCollough, Mark <mark_mccollough@fws.gov>; Perry, John <John.Perry@maine.gov>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Jay L. Clement - USACOE (jay.l.clement@usace.army.mil) <Jay.L.Clement@usace.army.mil>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Good morning James,

We have a lot of data sources and the qc can take quite some time, so unfortunately it is not a simple request to get an updated layer. We have started the process but Amy went out on leave today. She will be back just before Christmas.

So I expect the layer to be updated and available in January after the holidays.

Jennifer Vashon
Black Bear and Canada Lynx Biologist
Maine Dept of Inland Fisheries & Wildlife
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From: Morin, James [mailto:jmorin@burnsmcd.com]
Sent: Tuesday, December 04, 2018 8:59 AM
To: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Anna Harris <anna_harris@fws.gov>; Goodwin, Mark <magoodwin@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; McCollough, Mark <mark_mccollough@fws.gov>; Perry, John <John.Perry@maine.gov>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Jay L. Clement - USACOE (jay.l.clement@usace.army.mil) <Jay.L.Clement@usace.army.mil>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Thanks Jen,

When can I expect this?

James P. Morin, LF*, CPESC\ Burns & McDonnell

Sr. Environmental Scientist \ Forester

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From: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Sent: Wednesday, November 21, 2018 11:43 AM
To: Morin, James <jmorin@burnsmcd.com>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Anna Harris <anna_harris@fws.gov>; Goodwin, Mark <magoodwin@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; McCollough, Mark <mark_mccollough@fws.gov>; Perry, John <John.Perry@maine.gov>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Jay L. Clement - USACOE (jay.l.clement@usace.army.mil) <Jay.L.Clement@usace.army.mil>
Subject: RE: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jim,

I've checked in with Amy our GIS analysist. She is going out on leave in early December for 2 weeks, so she may not be able to update the layer with recent observations before her leave. If we are not able to get that to you, we will send our current layer as a starting point.

Happy Thanksgiving!

Jen

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From: Morin, James [mailto:jmorin@burnsmcd.com]
Sent: Friday, November 09, 2018 11:58 AM
To: Vashon, Jennifer <Jennifer.Vashon@maine.gov>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Johnston, Lauren A <lajohnston@burnsmcd.com>; Anna Harris <anna_harris@fws.gov>; Goodwin, Mark <magoodwin@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; McCollough, Mark <mark_mccollough@fws.gov>; Perry, John <John.Perry@maine.gov>; Stratton, Robert D <Robert.D.Stratton@maine.gov>; Jay L. Clement - USACOE

(jay.l.clement@usace.army.mil) <Jay.L.Clement@usace.army.mil>
Subject: [EXTERNAL SENDER] RE: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jen,

I am working on the Biological Assessment for the NECEC project and Mark McCollough mentioned that I reach out to you, specifically regarding Canada lynx snow track survey data, as well as point location data along the project corridor (see email chain below). Your point location data will be useful in determining the southernmost town to conduct the lynx habitat analysis. Any information you can provide would be greatly appreciated.

I'm also interested in any information that would help us better understand how an early successional scrub/shrub vegetated corridor may impact the lynx, its habitat, and snowshoe hare. This information would be useful in addressing the potential impacts that may result from the proposed project, as well as the assessment of any mitigation measures that can be taken during the clearing and construction phases.

Please refer to my email on 6/27/2017 for my original request for Canada lynx occurrence data and associated project overview map.

Thanks,

Jim

James P. Morin, LF*, CPESC\ Burns & McDonnell

Sr. Environmental Scientist \ Forester

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From: McCollough, Mark <mark_mccollough@fws.gov>
Sent: Tuesday, November 06, 2018 4:17 PM
To: Morin, James <jmorin@burnsmcd.com>; Goodwin, Mark <magoodwin@burnsmcd.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Anna Harris <anna_harris@fws.gov>
Subject: Re: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jim:

We don't have a white paper on techniques on how to map and quantify lynx habitat. Consultants have used different sources (forest company stand maps, 3D aerial photo interpretation, Erin Simons' UMaine lynx habitat model) and different methods to map and quantify habitat. Hopefully, the following provides enough guidance regardless of the data source. The methods you will use are similar to what we have requested for wind power projects (including their transmission corridors) in the past. Feel free to call if you wish to discuss ideas.

1. Ideally habitat should be mapped and quantified (acres impacted/cleared) by the following categories to address effects to lynx and their critical habitat:

- current high quality snowshoe hare habitat - dense, young (12-40 year old ~12-40-foot), predominantly (>50%) mixed wood or pure softwood (spruce-fir types) stands
- future high quality snowshoe hare habitat - all other predominantly (>50%) mixed wood or pure softwood (spruce-fir types) stands <12-years old >40-years old
- matrix forest habitat - all other forest types including mixed wood (<50% softwood) and pure hardwood stands regardless of age
- all other land types (e.g. water, wetlands, roads, etc.)

If you are using Weyerhauser stand maps, it is essential to develop a cross-walk between their stand types and assign them to the three categories of lynx habitat above. Feel free to run your cross-walk with us. We would be glad to comment.

If you are mapping habitat using 3D aerial photo interpretation you should use your best professional judgement to classify stands into the aforementioned types.

Regardless of method(s) used, please explain the methods well in the BA. Include crosswalks with stand maps, explain photo interpretation methods, etc. in the appendices.

How to present the information:

- We suggest that maps of lynx habitat depicting the three habitat types be included in the Biological Assessment.
- The maps should show the stand information or aerial photography on 500 feet on either side of the corridor. Habitat need only be delineated and quantified within the transmission line corridor that will be cleared. However, the larger view helps provide context and a better understanding of how the snowshoe hare/lynx habitat within the cleared corridor is juxtaposed with adjacent habitat.
- The acres of each of the three habitats to be cleared should be summarized for a) the entire project, b) by township, c) within the designated lynx critical habitat, and d) outside of the designated lynx critical habitat.

I don't believe we have determined the southernmost town to conduct the lynx habitat analysis. We should agree on the area where lynx habitat will be mapped and quantified. To start, we have a section 7 review area

that we share with Federal agencies (see attached). We suggest at least including towns in the section 7 review area map in your analysis.

We suggest that you contact Jen Vashon (lynx and bear biologist) at Maine Inland Fisheries and Wildlife. They have completed lynx snow track surveys in Maine for the last decade or so. They may know of towns south of this section 7 review area that may have lynx. If so, these towns should also be included in the analysis. Also, any point location of documented lynx occurrences in townships where the corridor will pass should be mapped and included in the BA. We have some information in our GIS that we could share with you, but it is not up to date. Jen Vashon and MDIFW have the most recent lynx occurrence data from various sources (snow track surveys, animals incidentally caught in traps, road mortality, radio-tag locations, etc.).

I think this guidance should be enough to get you started. Let me know if you wish to discuss further or want to check in from time to time as you are working on the analysis.

Thanks, Mark McCollough

On Tue, Nov 6, 2018 at 2:20 PM Morin, James <jmorin@burnsmcd.com> wrote:

> Mark,
>
> I am working with Mark Goodwin/Burns & McDonnell on the NECEC project and we are in the lengthy process of compiling all necessary information for the Biological Assessment. As part of the Canada lynx assessment section I am currently reviewing the forest stand data recently received from Weyerhaeuser (land management company) for the northern section of the project. However, there are sections along the northern corridor in the critical habitat area, as well as the Section 7 review area, where there is no forest stand data available. To fill in these gaps we will need to conduct our own desktop analysis using aerial imagery. It was noted in the June 7, 2017 agency meeting minutes that the USFWS would be able to provide guidance and protocols for this desktop analysis. I am reaching out to you for this guidance. If there is a specific methodology the USFWS requires for Canada lynx habitat desktop analysis that you could email me it would

be greatly appreciated. Otherwise, I would be happy to discuss your thoughts on this matter at your earliest convenience.

It would also be helpful to know if winter track field surveys are likely needed to support the BA.

Thanks,

Jim

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--

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MEETING MINUTES

Federal Agency Coordination, Status and Section 7 Consultation Meeting

***Contact**:*	*Mark Goodwin*
***Title**:*	*Environmental Manager – Burns & McDonnell*
***Date**:*	*March 19, 2019*
Time:	*12:30 pm-3:15 pm*
Location:	*Central Maine Power, Augusta, Maine and Teleconference*

Attendees:

Gerry Mirabile- Central Maine Power (CMP)
Jim Boyle- Boyle Associates
Mark Goodwin- Burns & McDonnell (BMCD)
Lauren Johnston- Burns & McDonnell (BMCD)
Jay Clement- United States Army Corps (USACE)
Wende Mahaney- US Fish and Wildlife Service (USFWS)
Mark McCollough- US Fish and Wildlife Service (USFWS)
Anna Harris- US Fish and Wildlife Service (USFWS)
Melissa Pauley- Department of Energy (DOE)
Julie Smith- Department of Energy (DOE)
Mark Kern- US Environmental Protection Agency (EPA)
Mike Marsh- US Environmental Protection Agency (EPA)
Beth ? – US Environmental Protection Agency (EPA)

Purpose:

Meeting/conference with several federal agencies to review the NECEC permitting status and the federal agencies' process and coordination. The second part of the meeting was specific to Section 7 [Endangered Species Act] consultation and the Biological Assessment preparation.

General Discussion:

Gerry Mirabile provided a project overview, reviewed the permit application submittal timelines and agency correspondence to date. He reviewed the upcoming DEP/LUPC hearing, process, potential schedule, and hearing topics.

- A few of the agencies expressed interest in the hearing schedule, particularly with regard to when alternatives would be discussed.
  - Action: The final hearing schedule should be circulated to the agencies that are not on the DEP/LUPC Service List.

Julie Smith expressed concern that CMP needs to be realistic regarding the permitting process timeline and to provide good communication.

- Action: Gerry will follow-up with DOE and try to understand what DOE needs for their review.

Mark Kern asked for guidance on what documents they should review rather than reading everything that is on the MDEP website. He was particularly interested in where the alternatives discussion is located. Jay explained that there have been a series of communications and responses to information requests so information is in multiple locations.

- Action: Circulate the Excel spreadsheet containing the MDEP weblinks to the application submissions since 9/2017.

Jay Clement provided an update and overview of the Corps process:

- The Public Notice will go out next week now that the MDEP hearing is scheduled. The Corps will attend the hearing with the intent of avoiding the need for a duplicative Corps hearing. The Corps has not ruled out the potential of a hearing and the public may request one.
- PN has a 30 day comment period, however comments will likely be accepted and considered after the 30 day period. Comments will be forwarded to CMP and can be rebutted by CMP; the Corps may ask CMP for additional information based on those comments.
- Process in working toward NEPA compliance. Various consultations- Section 106, Section 7, essential fish habitat (EFH) consultation (takes a second tier to ESA consultation)
- USACE will do an EA to determine if an EIS is necessary. This is standard for the Corps. Decision is made towards the end of the ACOE review process.

Mark Kern suggested that the Corps put out a draft EA to public comment in lieu of an EIS so that there is not public opposition to not considering an EIS. Jay stated the Corps had never done something like that but would not rule out the option. Jay said he would discuss this with staff in the Concord District Office.

Gerry asked if there is still the expectation that the Corps will issue a permit decision approximately 60 to 90 days after the MDEP. Jay said he could not provide a solid answer, however 90 days is probably more likely.

Gerry discussed the Preliminary JD and whether Section 10 was triggered for the Kennebec River since no work was planned in the river and so no impacts to navigation. Wende mentioned, "In, On, Over, or Under." Wende seemed uncertain as to how “under” is defined/determined; she laughed and said “good question”. Jay said that he will review it, however if it is jurisdictional there are no additional review criteria beyond those considered under Section 404.

Wende asked if more information would be provided for the preservation parcels. Gerry noted that this was provided as an attachment to the Compensation Plan. The spreadsheet with the MDEP links would provide the location where that could be found.

Jay said that he had asked for a pretty robust compensation plan, and that he thinks we’re there, but this could change.

Mark Kern discussed the following:

- The 2016 Mitigation Guidance and the changes that document included. Mark asked if Jay and Ruth were comfortable with what was provided for mitigation and compensation. Jay said he is fine with the assessment and information. Jay thinks that “we are there with the level of compensation provided.” In other words, Jay indicated he is satisfied with the plan.
- He asked if the alternatives analysis considered the option of burying the line along existing roadways. Gerry responded that the initial analysis focused on aerial routes because

undergrounding was cost prohibitive. The evaluation will be expanded in CMP's rebuttal testimony addressing these concerns raised by intervenors and will address impacts, constructability, cost etc.

- Action: Mark Kern and others would like the underground rebuttal testimony sent directly to him.

- For the underground alternatives analysis that will be provided in the rebuttal testimony, the agencies requested a comparison of burial costs to overall project costs, but minus the cost of any compensation or mitigation that is unnecessary due to undergrounding.
- Mark Kern asked if the alternatives analysis considers other border crossing locations. He asked if CMP considered moving it closer to an existing roadway. He noted that Route 27 crosses the Canadian border within 12 miles of the proposed crossing. He also noted that Route 201 crosses as well but further away from the existing crossing. Gerry responded that he recalls that CMP was provided by Hydro Quebec with a 20km crossing area along the Canada border within which the transmission line would need to be located.
    - Action: The request for additional alternative information should be considered in CMP's rebuttal testimony.

Melissa Pauley noted that an alternative analysis for the crossing location is not required by the DOE. She wants to confirm that the current design they have for the border crossing is accurate. She explained that the DOE's jurisdiction is generally limited to that area within 100 feet of the Canada border. This is a different/more limited jurisdictional approach than previously taken by DOE.

- Action: Confirm Melissa has the correct border crossing location and design.

Jay asked Melissa if the Presidential Permit considers what goes on in Canada. She said it does not. The USACE and DOE mentioned that they had been contacted by Stacy Laughton and Steve Kasprzak inquiring about the Canadian side of the project.

The discussion moved to Section 7 consultation and the Biological Assessment.

Biological Assessment

- Mark G. stated that the BA is about 40% complete with the final version expected late May or early June.
- Jay stated that the longer it takes to get the BA finalized there could be a delay. Add 135 days to when it has been submitted for formal consultation.
- Mark M. encouraged us to provide data prior to submission so there is not a lot back and forth.
- Jay said he will not be able to determine whether formal or informal consultation is needed until he sees the draft BA, because the effects determination will be based on the BA.

Northern Long Eared Bat

- Gerry asked what would warrant extended time of year restriction (TOYR) for tree clearing. Jay said that TOYR are best management practices are voluntary, however the larger the impacts the less discretion the Corps has in applying it. Ideally no clearing would occur in June and July. It is preferable to restrict clearing to between mid-October to mid-April (winter clearing). Winter clearing should be prioritized, however if clearing must take place outside the mid-October to mid-April period then no clearing should occur in June and July.
- Mark G. mentioned that we will have the revised total of forest clearing this afternoon.
- Jay asked for some correspondence recommitting TOYR in the VCP and CMP intends on doing that after the MDEP hearing process was concluded. Jay was comfortable with that.

- Will the TOYR apply to maintenance practices in the VMP? A general discussion occurred. Most of the maintenance is going to be shrubby species however some areas will have larger trees due to commitments made to the MDEP and MDIFW. Maintenance of these areas may involve larger tree removal and will occur on a 4 year maintenance cycle. CMP should continue discussion with the Corps as to whether the TOYR will apply to maintenance of these areas. This discussion and proposal should be incorporated into the BA. Jay is an advocate for "no tree clearing during June and July," however he doesn't have a position about maintenance at this point. Jay requested that we provide him some rough acreage for areas to be periodically "tapered" as well as larger tree clearing related to maintenance activities, and that these be included in the BA.
    - Action: Provide Jay the acreage of the tapered vegetation for this consideration.

Canada lynx

- BMCD has completed cover type mapping using Mark M's guidance.
- Jen Vashon provided BMCD with Lynx occurrence data and BMCD determined the southernmost boundary is in Starks. Mark M. wanted to know how far away from the project did the occurrence data include. He advised that a township on either side of the corridor should be considered. The BA should look at where lynx are known to occur along the northern portion of the transmission line as well and should provide this information.
- Jim Morin identified different quality habitat types and BMD has calculated the acres of clearing by habitat quality type in both excel spreadsheet format and kmz. BMCD intends to provide it to Mark M. for review.
- Mark M. asked that BMCD break the habitat out further and report clearing impacts within the designated critical habitat area and within the extended Section 7 consultation area.
- The BA should document well how the stands were delineated.
- Jay asked if we should consider field survey. Mark M. did not suggest that we need survey. We should assume they occur and use the MDIFW occurrence data as the southern- most boundary.
- The BA should address revegetation and vegetation management and how that may or may not affect lynx.

Atlantic salmon

- Salmon should be addressed in the BA, however there is not much of a concern due to proposed construction practices (except culvert replacements).
- There was a discussion of whether the culvert replacement proposals would trigger full consultation. We should address that in the BA. The culvert projects are not known at this time, however CMP intends to start by reviewing databases maintained by NGO's and Stream viewer to identify potential projects.
- A Corp permits will be required for specific culvert replacement projects. Is this separate from the existing Corp permit? There could be an option of using the USFWS programmatic agreement as a permit condition. Wende noted that this may be easiest solution.
    - Action: Review Programmatic Agreement http://atlanticsalmonrestoration.org/projects/stream-crossing-project
- Perhaps we avoid culvert replacement projects on salmon streams. Wende says this may be a missed opportunity. Jay suggests that maybe permit condition to the effect of: "relative to these monies, if a site is identified in salmon critical habitat, a corps permit will be required…." No firm decision made on this. The future money holder would need to apply for the Corps permit, which would not necessarily be CMP.
- Jay suggested setting up a conference call with MDIFW to discuss.

- Action: Continue discussion regarding in-stream work related to culvert replacements and schedule a meeting with USACE and MDIFW.

- The BA should include a typical figure of a temporary stream crossing, discussion of buffers and what occurs in them. There should be a discussion of loss of shading, increased water temperatures, etc.
- Mark G. noted that generally for each species we will evaluate impacts and mitigation measures for each construction sequence and habitat.

Small whorled pogonia

- CMP's current, proposed alignment avoids cutting in the area of the SWP.
- Gerry said CMP is evaluating other options for design and that they are considering preservation of the parcel that contains the surveyed SWP if other SWP can be found on the same parcel and preserved. The potential tradeoff would be a return to the original transmission line alignment which would involve clearing the 75 feet needed, leaving a 12 foot wooded buffer between the transmission line corridor and the SWP.
- Generally, Mark M. was amenable to this idea and would like to talk with Don Cameron at Maine Natural Areas Program (MNAP) regarding survey timing. CMP intends to meet with MNAP on Thursday to discuss.
- Mark M. discussed three other known locations of SWP in Maine . He said there might be an opportunity for CMP to work with MNAP and The Nature Conservancy to preserve those properties as compensation.

Mark M. had the following questions:

- Are there comments from intervenors regarding Atlantic salmon?
  - Action: Send CMP rebuttal regarding Atlantic salmon to USFWS.

Mark M. discussed bald and golden eagle surveys.

- There have not been surveys initiated by CMP yet.
- February 2020 is the anticipated construction start date.
- Survey this spring prior to construction.
- Right now is ideal time to conduct a survey, however the latest dates are mid-April for the southern section and first week and May for the northern section.
- A quarter mile on either side of the corridor should be surveyed.
  - Action: Schedule eagle surveys asap.

Summary of Action Items:

- The final hearing schedule should be circulated to the agencies that are not on the DEP/LUPC Service List.
- Gerry will follow-up with DOE and try to understand what DOE needs for their review.
- Circulate the Excel spreadsheet containing the MDEP weblinks to the application submissions.
- Send Mark Kern and others the underground rebuttal testimony directly.
- The request for additional alternative information should be considered in CMP's rebuttal testimony.
- Confirm Melissa has the correct border crossing location and design.
- Provide Jay the acreage of the tapered vegetation for this consideration.

- Continue discussion regarding in-stream work related to culvert replacements and schedule a meeting with USACE and MDIFW.
- Send CMP rebuttal regarding Atlantic salmon to USFWS.
- Schedule eagle surveys.

Asali, Natasha

From: McCollough, Mark <mark_mccollough@fws.gov>
Sent: Wednesday, March 20, 2019 9:37 AM
To: Johnston, Lauren A; Goodwin, Mark; Don Cameron
Subject: Small whorled pogonia survey timing

Follow Up Flag: Follow up
Flag Status: Completed

Hi Lauren and Mark:

Thanks for the informative meeting with CMP yesterday. During the meeting Gerry asked how early surveys could be conducted for small whorled pogonia. Ideal timing is mid-June. I know I said mid-May yesterday, but Don Cameron felt that some plants may not have emerged by then. You can discuss further in your meeting with MNAP tomorrow. I will be unable to attend, but look forward to hearing more about options at the SWP site in Greene.

thanks, Mark McCollough

--

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NECEC - Jay
USFWS - Wende
CMP - Gerry, Jim Boyle
MNAP - Molly, Don, Kristen
Lauren Johnston

3-21-19 NECEC SWP discussion

Gerry - SWP summary to date

1 occurrence w/in 87 feet of cleared ROW based on summer 2018 survey

original line location would have clearing within 12 feet of plant

SO → re-designed to avoid all clearing around 1 plant involved re-design of existing line so new DC could be scooted to the east

now CMP wants to explore other options:

1. peel off a section of line to the west of 1 plant if surveys show no other plants, about 9 acre area for this new "jog" in the corridor
2. survey entire 174 acre parcel and if more plants are found, explore preservation and going back to original alignment to clear within 12 feet of one plant and acknowledge loss of 1 plant
3. explore other preservation options for other offsite SWP places to protect and go back to original clearing within 12 feet and acknowledge loss of 1 plant

Berwick)
or
r - Lancaster
oe area)
n
over)

the 174 acres

↗

D.

Art Gilman is available in June to survey and CMP is okay with Art teaming up with MNAP and USFWS to do the survey

MNAP still wants to have more survey work to better understand the context of the 1 known plant to inform decisions about alignment and I agreed totally on behalf of Mark/USFWS EVEN IF landowner says they are not interested in selling the entire parcel or some part of it

Survey should happen in mid-June (not May) based on advice of when MNAP does their surveys → they never go out before mid-June although some plants could be out in May

USFWS on board with this → mark confirmed by email to Lauren Johnston, Lauren will forward this to Gerry @ CMP

North Berwick - 297 plants when last surveyed (2016) "best" site, on private land 25-30 acres

Parsonfield 80 acre in-holding in a forest easement
25 plants (2016) and more in larger easement area

"best" options for possible off-site preservation per MNAP

Don -

have to assume some portion of a given population is dormant and underground in any given year, 1-3 years of dormancy pretty common to as much as 7-years in the "extreme"

next step - coordinated survey in June between CMP with MNAP and USFWS

Asali, Natasha

From: McCollough, Mark <mark_mccollough@fws.gov>
Sent: Friday, April 5, 2019 9:38 AM
To: Morin, James
Cc: Goodwin, Mark; Mirabile, Gerry J.; Johnston, Lauren A; Jim Boyle (jboyle@boyleassociates.net); Jay L. Clement - USACOE (jay.l.clement@usace.army.mil); Wende Mahaney
Subject: Re: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Jim:

My apologies for not getting back to you sooner. We have had a busy schedule the last two weeks.

I received your information and phone message. Thank you for all the work you have done in compiling this information. I reviewed the Excel table and kmz maps. They were very useful and will form the basis for the Biological Assessment. A few requests and/or suggestions:

1). The lynx critical habitat includes several primary constituent elements (per the regulation that designates the critical habitat) including habitat for snowshoe hares (that you have already delineated - present and future) and matrix habitat (forested habitat that lynx can easily move through to access feeding, denning, and their home range). The data are all available from your delineations. We suggest summarizing the effects to lynx habitat in the following way to capture all of the primary constituent elements of critical habitat:

	Current high quality hare habitat	Future high quality hare habitat	Total hare habitat (current + future)	Matrix habitat (all other forested habitat)	Non-habitat (lakes, roads, open wetlands	Total
Within the critical habitat only						865 a
In the USFWS section 7 review area outside of the critical habitat						352 a
Outside of the USFWS section 7 review area (but still near lynx observations)						137 a
Total footprint of cleared forest in the range of lynx						1335 a

2. Can you please provide a description of the stand types? I am familiar with the designations, but particularly want to confirm that young (recently cut <10 years) softwood-dominated stands are being tabulated as future lynx habitat. Also, cedar swamps and cedar-dominated forested wetlands are delineated and tabulated under mature softwood, correct? All other forest types should be considered matrix habitat.

3. Thanks for working with MDIFW to compile the lynx occurrences near the project area. This is very helpful.

I think this is all for now. In addition to the information above, the BA should document the various activities and timing of activities associated with the project construction and operation and their anticipated effects on lynx. Revegetation plans and descriptions should be included along with anticipated short- and long-term effects on lynx and their habitat. Information from the scientific literature should be provided to assess whether the corridor is anticipated to affect lynx movements. Effects from the loss of habitat should be considered based on the information you obtained on lynx occurrences and effects relative to average lynx home ranges in Maine. Your analysis provided above will provide the basis of overall effects to lynx habitat and whether the project adversely modifies the designated critical habitat. The Corps will use the BA to make a determination whether all effects are not likely to adversely affect (NLAA) or will adversely affect lynx. A NLAA determination is informal consultation that should not take long to complete if the BA is thorough. A determination of adverse effects would result in a formal consultation between the Corps and Service and the Service writing a biological opinion. In our last meeting, we mentioned that a formal consultation could last as long as 135 days after the Corps initiates the consultation process. A good BA will facilitate informal or formal consultation.

Let me know if you have questions or want to discuss.

Thanks again for all the work you have done.

Mark McCollough

On Mon, Mar 25, 2019 at 8:56 AM Morin, James <jmorin@burnsmcd.com> wrote:

> Mark,
>
> In November of last year I consulted with you on the methodology for mapping and analyzing High Quality Snowshoe Hare/Canada Lynx habitat on the New England Clean Energy Connect Project (See email chain below).
>
> As part of my lynx/hare habitat analysis I've delineated the forest into stand types along the NECEC corridor in the Critical Habitat area and the Section 7 review area. I've also extended my delineations to the Stark/Industry town line, as being the southernmost point for my habitat analysis based on lynx observation data obtained from Jen Vashon/MDIFW (see attached lynx observations kmz). I used the forest stand data supplied to CMP by Weyerhaeuser as the basis for my delineation work in the Critical Habitat area. South of the Critical Habitat Area I delineated polygons to the Starks/Industry town line using high quality color aerial imagery from Google Earth. The attached CanadaLynx 3_21_19 kmz reflects the delineation work and has different layers that can be turned on and off to show the quality habitat sites/forest stands I identified in the Critical Habitat area, the Section 7 review area, and outside the Section 7 review from Across Town Road in Embden to the Starks/Industry town line.
>
> There are different color codes (shade) in the kmz for each of the following:
>
> - Purple shade for Current High Quality Snowshoe Hare Habitat (S3D, S3C, S4D, S4C, SH3D, SH3C, SH4D, SH4C)

- Green shade for Future High Quality Snowshoe Hare Habitat (S2D, S2C, S2B, S1A, S5D, S5C, SH2D, SH2C, SH5D, SH5C)

Attached also find a spreadsheet that includes seven tabs. The first tab is a summary of the amount of acres that will be impacted in the Critical Habitat Area, the Section 7 review area (which also includes the Critical Habitat Area), and the area south of the Section 7 review area to the town of Starks. The second tab defines the forest stand delineation codes. The third tab is a list of all the quality groups/forest stands from the Canada boarder to the Starks/Industry town line. The fourth tab is just the forest stands within the Critical Habitat Area. The fifth tab is just the forest stands in the Section 7 review area (this includes the Critical Habitat Area). The sixth tab is the area outside the Section 7 review area to the Starks/Industry town line. The final seventh tab is all the sites combined.

This information provided is the foundation of our lynx/hare habitat analysis.

We appreciate your review, comments, and suggestions on how this data should be utilized to maximize its value in determining potential effects.

Please call me to discuss with questions if needed.

Thanks,

Jim

James P. Morin, LF*, CPESC \ Burns & McDonnell

Sr. Environmental Scientist \ Forester

Office 207-808-4924 \ **Mobile** 207-229-6752

jmorin@burnsmcd.com \ burnsmcd.com

27 Pearl Street \ Portland, Maine 04101

From: McCollough, Mark <mark_mccollough@fws.gov>
Sent: Tuesday, November 06, 2018 4:17 PM
To: Morin, James <jmorin@burnsmcd.com>; Goodwin, Mark <magoodwin@burnsmcd.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>; 'gerry.mirabile@cmpco.com' (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>
Cc: Mahaney, Shawn B NAE <Shawn.B.Mahaney@usace.army.mil>; Anna Harris <anna_harris@fws.gov>
Subject: Re: [EXTERNAL] Guidance and protocols for the Canada Lynx habitat desktop analysis

Hi Jim:

We don't have a white paper on techniques on how to map and quantify lynx habitat. Consultants have used different sources (forest company stand maps, 3D aerial photo interpretation, Erin Simons' UMaine lynx habitat model) and different methods to map and quantify habitat. Hopefully, the following provides enough guidance regardless of the data source. The methods you will use are similar to what we have requested for wind power projects (including their transmission corridors) in the past. Feel free to call if you wish to discuss ideas.

1. Ideally habitat should be mapped and quantified (acres impacted/cleared) by the following categories to address effects to lynx and their critical habitat:

- current high quality snowshoe hare habitat - dense, young (12-40 year old ~12-40-foot), predominantly (>50%) mixed wood or pure softwood (spruce-fir types) stands
- future high quality snowshoe hare habitat - all other predominantly (>50%) mixed wood or pure softwood (spruce-fir types) stands <12-years old >40-years old
- matrix forest habitat - all other forest types including mixed wood (<50% softwood) and pure hardwood stands regardless of age
- all other land types (e.g. water, wetlands, roads, etc.)

If you are using Weyerhauser stand maps, it is essential to develop a cross-walk between their stand types and assign them to the three categories of lynx habitat above. Feel free to run your cross-walk with us. We would be glad to comment.

If you are mapping habitat using 3D aerial photo interpretation you should use your best professional judgement to classify stands into the aforementioned types.

Regardless of method(s) used, please explain the methods well in the BA. Include crosswalks with stand maps, explain photo interpretation methods, etc. in the appendices.

How to present the information:

- We suggest that maps of lynx habitat depicting the three habitat types be included in the Biological Assessment.
- The maps should show the stand information or aerial photography on 500 feet on either side of the corridor. Habitat need only be delineated and quantified within the transmission line corridor that will be cleared. However, the larger view helps provide context and a better understanding of how the snowshoe hare/lynx habitat within the cleared corridor is juxtaposed with adjacent habitat.
- The acres of each of the three habitats to be cleared should be summarized for a) the entire project, b) by township, c) within the designated lynx critical habitat, and d) outside of the designated lynx critical habitat.

I don't believe we have determined the southernmost town to conduct the lynx habitat analysis. We should agree on the area where lynx habitat will be mapped and quantified. To start, we have a section 7 review area that we share with Federal agencies (see attached). We suggest at least including towns in the section 7 review area map in your analysis.

We suggest that you contact Jen Vashon (lynx and bear biologist) at Maine Inland Fisheries and Wildlife. They have completed lynx snow track surveys in Maine for the last decade or so. They may know of towns south of this section 7 review area that may have lynx. If so, these towns should also be included in the analysis. Also, any point location of documented lynx occurrences in townships where the corridor will pass should be mapped and included in the BA. We have some information in our GIS that we could share with you, but it is not up to date. Jen Vashon and MDIFW have the most recent lynx occurrence data from various sources (snow track surveys, animals incidentally caught in traps, road mortality, radio-tag locations, etc.).

I think this guidance should be enough to get you started. Let me know if you wish to discuss further or want to check in from time to time as you are working on the analysis.

Thanks, Mark McCollough

On Tue, Nov 6, 2018 at 2:20 PM Morin, James <jmorin@burnsmcd.com> wrote:

> Mark,
>
> I am working with Mark Goodwin/Burns & McDonnell on the NECEC project and we are in the lengthy process of compiling all necessary information for the Biological Assessment. As part of the Canada lynx assessment section I am currently reviewing the forest stand data recently received from Weyerhaeuser (land management company) for the northern section of the project. However, there are sections along the northern corridor in the critical habitat area, as well as the Section 7 review area, where there is no forest stand data available. To fill in these gaps we will need to conduct our own desktop analysis using aerial imagery. It was noted in the June 7, 2017 agency meeting minutes that

the USFWS would be able to provide guidance and protocols for this desktop analysis. I am reaching out to you for this guidance. If there is a specific methodology the USFWS requires for Canada lynx habitat desktop analysis that you could email me it would be greatly appreciated. Otherwise, I would be happy to discuss your thoughts on this matter at your earliest convenience.

It would also be helpful to know if winter track field surveys are likely needed to support the BA.

Thanks,

Jim

James P. Morin, LF*, CPESC \ Burns & McDonnell

Sr. Environmental Scientist \ Forester

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Mark McCollough, Ph.D.
Endangered Species Specialist
US Fish and Wildlife Service
Maine Fish and Wildlife Service Complex

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United States Department of the Interior

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

In Reply Refer To: May 29, 2019
Consultation Code: 05E1ME00-2017-SLI-0579
Event Code: 05E1ME00-2019-E-01897
Project Name: New England Clean Energy Connect

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2017-SLI-0579

Event Code: 05E1ME00-2019-E-01897

Project Name: New England Clean Energy Connect

Project Type: TRANSMISSION LINE

Project Description: Proposed CMP transmission line from Beattie Township to Pownal and Windsor to Wiscasset.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.722717009714806N70.03484380339984W

Counties: Androscoggin, ME | Cumberland, ME | Franklin, ME | Kennebec, ME | Lincoln, ME | Sagadahoc, ME | Somerset, ME

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

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

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

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

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

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* Population: Gulf of Maine DPS There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Atlantic Salmon *Salmo salar* https://ecos.fws.gov/ecp/species/2097#crithab	Final
Canada Lynx *Lynx canadensis* https://ecos.fws.gov/ecp/species/3652#crithab	Final

MEETING MINUTES
NECEC USFWS Update and Section 7 Process Meeting

***Contact**:* *Mark Goodwin*
***Title**:* *Environmental Manager - Burns & McDonnell*
***Date**:* *December 17, 2019*
Time: *2:00pm*
Location: *Teleconference*

Attendees:
Gerry Mirabile- CMP
Mark Goodwin- Burns & McDonnell
Lauren Johnston- Burns & McDonnell
Sam Rice- Burns & McDonnell
Jay Clement- USACE
Wendy Mahaney- USFWS
Julie Smith- USDOE

Discussion:.
This meeting was a follow-up to last Friday's meeting where Jay communicated Biological Assessment (BA) edits to BMCD. This meeting was held with USFWS to address their specific questions.

Wende: The draft BA has to capture CMP's intent of the culvert replacement program. Section 7 consultation doesn't have the flexibility for "decisions on the fly" so the culvert replacement program must be addressed in the BA. We need to understand the potential scope of this work, number of culverts, and what type of action that CMP might be thinking about.

Gerry: Desktop and field work to identify culverts that might need to be replaced for Off ROW Access Road (ORAR) use has been conducted from Moscow northwest to the international border (Segments 1 and 2). The ORAR assessment identified access roads with hanging, undersized or collapsed culverts. Most of the culverts were for waterbars or for stormwater drainage off the road. There were only about a dozen stream culverts that were identified that will require replacement. CMP has not yet evaluated culverts that may exist in the right-of-way (ROW).

Jay: How many actually need to be replaced vs. how many must be replaced to support construction equipment?

Gerry: It's possible to use crane mats to span these culverts in lieu of replacement.

Jay: He wants to know more about construction procedures. For example: sizing, cofferdams, stabilization, removing cofferdams, or something more than that?

Gerry: The Project would use Stream Smart principals for culvert replacements. If we do this work in Atlantic salmon streams then CMP would be open to using the Atlantic Salmon restoration Programmatic Agreement. Culverts located in the ROW will be identified during construction walk throughs. CMP might have to use crane mats instead of replacing culverts in certain areas due to timing/Section 7 constraints.

Jay: To avoid potential re-initiation of consultation for culverts that are currently unknown and unevaluated, the BA could get a lot deeper into the weeds as part of the process, action, etc.. Or, if CMP commits to simply not replacing those culverts, and crossing with crane mats, and allow consultation to be completed and then it could be re-initiated at some point in the future. The complicating factor with that is that we must capture the cumulative impacts with this consultation now.

Mark: Suggest to simply not do culvert replacement in Atlantic salmon streams, but that commitment doesn't benefit the habitat.

Jay: That is certainly an option.

Wende: If you are going to replace culverts in Atlantic salmon streams then you have to consult on them. There is an opportunity here for salmon habitat restoration but that comes with required consultation.

Mark: One of the Programmatic activities is stream simulation structures (?). That activity is not likely to impact salmon. If CMP was able to commit to this, could the BA commit to this plan?

Wende: The Programmatic Agreement is not the end. There is Tier 1 and 2 consultation. Still Section 7 consultation would be much more expedited: 14 days for formal, 10 days for informal. USFWS would need to have all the details and have all the consultation. We could frame it as, anytime CMP identifies a culvert, then we can start the programmatic process individually or in groups. CMP would still need to provide all details and the Corps and USFW would need to process the Tier 2 consultation.

Wende: We could punt the Section 7 consultation down the road. The Programmatic Agreement requires extensive amount of survey data, design, consultation with Corps and USFW. It's not something that happens in a week or two. They could do consultation in a week or two. CMP has to collect stream survey information. USFWS would be open to doing it in batches, but each project would need to have a package.

Mark: Suggested that most of this work would be completed during restoration of the project. During construction, CMP would mat over stream and address culvert replacement during restoration. This is the window of time we would need.

Wende: How long would it take to identify the need for a replacement and when would restoration occur.

Mark: Less than 18 months. Construction in any given area would be less than 18 months.

Gerry: References the culvert replacement proposal. The proposal notes that culvert replacement may occur during restoration phase.

Jay: Prefers to pre-address it now.

Mark: There is an opportunity to improve habitat. The process is constraining this opportunity.

Wende: CMP did have the option of identifying of those culverts prior to now.

Jay: CMP committed to a plan.

Gerry: The Plan is mostly or entirely discretionary. We can do work that triggers Section 7 and then revisit it when we might trigger it after construction. Would it be appropriate to defer the Plan until then?

Wende: Is the Maine Department of Environmental Protection (MDEP) going to require the culvert replacements?

Gerry: It is a component of the compensation plan, so it will be required if approved by MDEP.

Jay: If there is no effect (i.e. no culvert replacement in Atlantic salmon streams), then there is no need to consult.

Wende: We have to consult on the entire project.

Mark: The process for selecting culvert replacement is CMP's responsibility. The replacement program was meant to specifically address unavoidable impact to coldwater fisheries and does not specifically mention streams that are considered Atlantic Salmon habitat. We could simply avoid culvert replacement in any stream that is considered Atlantic Salmon habitat.

Wende: Are any of them in critical habitat?

Mark: Unless the DEP says otherwise, it would be CMP's recommendation for culvert replacements. Right now, there are no culvert replacements identified that would affect Atlantic salmon habitat. In fact, the culverts that have been identified are all in Segment 1 and 2 of the Project, are outside of the mapped designated critical habitat.

Wende: The document is very broad. You should do an analysis and show that there would be zero (culverts replacements in Atlantic salmon habitat).

Mark: There is no critical habitat above Wyman damn. For the most part Segment 1 and 2 is not a concern.

Mark: We can provide locations for the first twelve that we are evaluating.

Jay: We have to somehow address the idea of replacement if it's going to be a requirement of the state.

Wende: It should be addressed in all of its elements. Not just the ORARs but also in corridor.

Jay: Is there an approach where we can address it but at the same time account for a more in depth analysis at some future point.

Gerry: There may be distinction between the ORAR's that are needed for construction access vs. culverts that need to be replacement because they are barriers to fish. If we determine that there is a work around for crossings needed for construction, focus on that issue. Second issue is barriers to fish passage. It could be that none of the culverts are actually fish barriers but are a construction impediment.

Jay: Compensation is proposed for both MDEP and Corps. You also are providing the fund for MDIFW. $200k and $180k. Is this compensation?

Jay: Possible permit condition that would require that if any identified crossings that "may affect" salmon will come in for a permit, will use the stream crossing programmatic agreements, $200k. Assuming that CMP is willing to commit to all the data collection. Standards are stringent, more stringent than IFW. Stream simulation is more than stream smart.

Gerry: Defer identification of specific stream at a later date. Make it not part of this consultation.

Jay: CMP is committing that if they identify streams, they'll commit to the programmatic agreement. Not completely punting it but acknowledging it.

Wende: Address actions in the context of construction. More specifics regarding culverts that may have to be spanned. Construction related culvert work will have an effect.

Morin, James

From: Clement, Jay L CIV USARMY CENAE (USA) <Jay.L.Clement@usace.army.mil>
Sent: Monday, January 06, 2020 1:48 PM
To: Gerry J. Mirabile (gerry.mirabile@cmpco.com); Goodwin, Mark
Cc: Johnston, Lauren A; melissa.pauley@hq.doe.gov
Subject: FW: [Non-DoD Source] Re: [EXTERNAL] FW: examples in other BAs

Follow Up Flag: Follow up
Flag Status: Completed

For your reference going forward.

-----Original Message-----
From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Monday, January 6, 2020 12:30 PM
To: Clement, Jay L CIV USARMY CENAE (USA) <Jay.L.Clement@usace.army.mil>
Cc: Wende_Mahaney@fws.gov
Subject: [Non-DoD Source] Re: [EXTERNAL] FW: examples in other BAs

Hi Jay:

Thanks for finding these examples of action areas for lynx. I have not had time to do the same. I think the 1 mile buffer would be adequate for lynx in Maine. I can't think of any direct or indirect effects associated with the construction and implementation of the CMP project that would affect lynx beyond this distance. (In the examples above, I can understand the larger buffer - 6 miles - for a mine project where there would be repeated blasting, etc. for years.) One mile seems appropriate for documenting environmental baseline and predicted cumulative effects. Other Federal actions within the one mile buffer would include the Appalachian Trail (any other Federal activities????).

The analysis of effects on the project to lynx habitat would be limited to those within proposed cleared areas (not a one-mile buffer).

Let me know if you want to discuss further with CMP or Burns and MacDonald.

Mark

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: January 15, 2020
Consultation Code: 05E1ME00-2017-SLI-0579
Event Code: 05E1ME00-2020-E-01568
Project Name: New England Clean Energy Connect

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

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

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

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

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

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

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

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

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2017-SLI-0579

Event Code: 05E1ME00-2020-E-01568

Project Name: New England Clean Energy Connect

Project Type: TRANSMISSION LINE

Project Description: Proposed CMP transmission line from Beattie Township to Pownal and Windsor to Wiscasset.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.722717009714806N70.03484380339984W

Counties: Androscoggin, ME | Cumberland, ME | Franklin, ME | Kennebec, ME | Lincoln, ME | Sagadahoc, ME | Somerset, ME

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

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

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

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

---

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

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* Population: Gulf of Maine DPS There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Atlantic Salmon *Salmo salar* https://ecos.fws.gov/ecp/species/2097#crithab	Final
Canada Lynx *Lynx canadensis* https://ecos.fws.gov/ecp/species/3652#crithab	Final

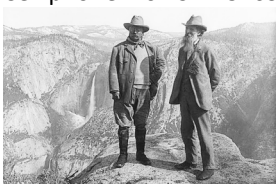
Morin, James

From: McCollough, Mark <mark_mccollough@fws.gov>
Sent: Thursday, April 02, 2020 10:05 AM
To: Morin, James
Cc: Mahaney, Wende; Gerry J. Mirabile (gerry.mirabile@cmpco.com); Goodwin, Mark; Johnston, Lauren A
Subject: Re: [EXTERNAL] reducing speed limits on logging road to avoid impacts to lynx

Yes, 30 mph seems reasonable. We believe that would reduce probability of traffic mortality of lynx. Its unlikely that trucks could travel very fast on these roads anyway.

Mark

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



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

From: Morin, James <jmorin@burnsmcd.com>
Sent: Thursday, April 2, 2020 9:34 AM
To: McCollough, Mark <mark_mccollough@fws.gov>
Cc: Mahaney, Wende <wende_mahaney@fws.gov>; Gerry J. Mirabile (gerry.mirabile@cmpco.com) <gerry.mirabile@cmpco.com>; Goodwin, Mark <magoodwin@burnsmcd.com>; Johnston, Lauren A <lajohnston@burnsmcd.com>
Subject: [EXTERNAL] reducing speed limits on logging road to avoid impacts to lynx

Mark,
I'm hoping you can provide some guidance. I am updating the Biological Assessment for the NECEC project, and as part of the Lynx section I would like to revise a statement that references project personal reducing speeds on logging roads, and I would like your recommendation as to what you think that reduced speed limit should be.

This request comes from comments made by the DOE and USACE on our draft BA requesting an actual speed limit.

For reference, the MDEP final department order for the Bowers Mountain wind project by Champlain Wind, LLC states in part on page 28 of 45 "The applicant determined that the project would not result in habitat loss for the lynx. The project would include minimal road construction, with all roads posted to speeds less than 30 mph. The applicant thereby concludes that the proposed project should not adversely impact Canada Lynx or its habitat."

Would you also conclude that 30 mph is an acceptable speed limit for project personal on logging roads?

I appreciate your consideration.

Thanks,
Jim

James P. Morin, LF*, **CPESC** \ Burns & McDonnell
Sr. Environmental Scientist \ Forester LF3318
Office 207-808-4924 \ **Mobile** 207-229-6752 (best option)
jmorin@burnsmcd.com \ burnsmcd.com
27 Pearl Street \ Portland, Maine 04101

*Licensed in: ME

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: May 29, 2020
Consultation Code: 05E1ME00-2017-TA-0579
Event Code: 05E1ME00-2020-E-03942
Project Name: New England Clean Energy Connect

Subject: Verification letter for the 'New England Clean Energy Connect' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Lauren Johnston:

The U.S. Fish and Wildlife Service (Service) received on May 29, 2020 your effects determination for the 'New England Clean Energy Connect' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Atlantic Salmon, *Salmo salar* (Endangered)
- Canada Lynx, *Lynx canadensis* (Threatened)
- Small Whorled Pogonia, *Isotria medeoloides* (Threatened)

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

New England Clean Energy Connect

2. Description

The following description was provided for the project 'New England Clean Energy Connect':

> Proposed CMP transmission line from Beattie Township to Pownal and Windsor to Wiscasset.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.722717009714806N70.03484380339984W

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. [Semantic] Is the project action area located within 0.25 miles of a known northern long-eared bat hibernaculum?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

6. [Semantic] Is the project action area located within 150 feet of a known occupied northern long-eared bat maternity roost tree?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type ‘0’ in questions 1-3.

1. Estimated total acres of forest conversion:

1038

2. If known, estimated acres of forest conversion from April 1 to October 31

1038

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type ‘0’ in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type ‘0’ in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type ‘0’ in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: May 29, 2020
Consultation Code: 05E1ME00-2017-SLI-0579
Event Code: 05E1ME00-2020-E-03941
Project Name: New England Clean Energy Connect

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

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

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

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

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

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

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cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

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

Attachment(s):

- Official Species List

Official Species List

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This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2017-SLI-0579

Event Code: 05E1ME00-2020-E-03941

Project Name: New England Clean Energy Connect

Project Type: TRANSMISSION LINE

Project Description: Proposed CMP transmission line from Beattie Township to Pownal and Windsor to Wiscasset.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.722717009714806N70.03484380339984W

Counties: Androscoggin, ME | Cumberland, ME | Franklin, ME | Kennebec, ME | Lincoln, ME | Sagadahoc, ME | Somerset, ME

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

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

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

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

---

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

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* Population: Gulf of Maine DPS There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097	Endangered

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Atlantic Salmon *Salmo salar* https://ecos.fws.gov/ecp/species/2097#crithab	Final
Canada Lynx *Lynx canadensis* https://ecos.fws.gov/ecp/species/3652#crithab	Final

EXHIBIT B: CMP ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES ON TRANSMISSION LINE AND SUBSTATION PROJECTS

Environmental Guidelines For Construction and Maintenance Activities on Transmission Line And Substation Projects

Prepared for:

Central Maine Power Company
83 Edison Drive
Augusta, Maine 04336

Prepared by:

TRC Engineering, LLC
249 Western Avenue
Augusta, Maine 04330

DOCUMENT REVISION LOG

Rev.	Section	Description	Appv'd by	Date
-	All	Initial Release		1992
-	All	Update Document Prepared by EPRO	G. Mirabile	Nov 2000
-	Multiple	Update to correspond to DEP Guidelines	G. Mirabile	Dec 2007
-	3, 5	Update to correspond to DEP Guidelines	G. Mirabile	May 2011
1	All	Converted to ISO Controlled Document	G. Mirabile	Oct 2012
2	All	Changed Doc Type from SOP to Reference	R. Koster	Mar 2015
3	9 & Appendix A	Revised Section 9.2.5 and 9.2.7 (Restoration Methods), and Appendix A (Temporary Access Road definition)	G. Mirabile	August 2016
4	Various	Consistency with latest MDEP BMPs	G. Mirabile	June 2018

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LIST OF TABLES

LIST OF APPENDICES

CENTRAL MAINE POWER COMPANY

Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects

1.0 INTRODUCTION

These guidelines contain standards and methods used to protect soil and water resources during construction, reconstruction, and maintenance of transmission lines and substations. They are based on practical methods developed for construction in utility corridors and their use is enforced by both State of Maine and Federal regulatory agencies. The construction practices described in this manual are typically required by the regulatory agencies for all projects. These practices are commonly referred to as Best Management Practices (BMPs). Illustrations have been provided as part of this manual (Appendix D) which demonstrate both the proper and improper techniques used for the more common construction activities.

All contracts for work performed on Central Maine Power Company (CMP) transmission line rights-of-way and substation sites will include these specific guidelines to ensure the project is constructed in an environmentally conscious manner. CMP personnel or their designated representatives will ensure that the guidelines are followed by inspecting all work and prescribing corrective steps to be taken where necessary. While this manual takes into consideration legal requirements, project personnel are still responsible for compliance with all federal, state, and local requirements.

This guide uses a number of scientific and technical terms. Definitions of these terms are provided in Appendix A.

2.0 PLANNING AND DESIGN CONSIDERATIONS

Planning is an important practice that will reduce the risk of erosion on a construction site, saving both time and money for Central Maine Power Company and its contractors. An erosion control plan should be prepared during project planning and design phases. It will likely be required for any Maine Department of Environmental Protection and/or local permits.

The erosion control plan should consist of:

- A narrative.
- A map.
- Plan details.

The narrative should describe the proposed project, existing site conditions, adjacent land uses, and any natural resources or properties that might be affected by the project. Other important details to include are descriptions of critical areas, proposed construction start and end dates, construction sequence, and brief descriptions of erosion and sedimentation control measures,

inspections and maintenance programs, and other clearing or construction that has taken place on the site in the last five years.

The map should include pre-development site contours at a scale to identify runoff patterns (minimum 5-foot contour interval), final contours, limits of clearing and grading, existing buffers, critical areas, natural resources, erosion control measures, and other clearing or construction that has taken place on the site in the last five years.

The plan details should include drawing of the erosion control structures and measures, design criteria and calculations, seeding specifications, and inspection and maintenance notes.

Key considerations include resource identification, familiarizing all parties with the construction site and limitations, and construction sequence.

2.1 Resource Identification

Sensitive natural areas which will receive priority treatment include:

- Streams and rivers.
- Great ponds.
- Wetlands.
- Steep slopes.
- Unstable soil conditions.

Sensitive natural areas which may receive priority treatment, depending upon the specifics of the project, include:

- Stream, river, pond, and wetland buffers.
- Significant wildlife habitats.
- Habitat for rare species.
- Historic and prehistoric sites.

During the planning phase, all sensitive natural areas that require priority treatment will be identified. The method of avoiding or crossing the sensitive natural areas to minimize impacts will be identified and incorporated into the project plans. Project plans should be designed and drawn to provide contractors and inspectors with a comprehensive reference guide that include, but is not limited to, locations of sensitive natural areas, access, and abutter and landowner issues. If modifications to the plans need to be made in the field, a designated person shall make necessary changes and shall notify all necessary personnel promptly. Copies of these plans should be provided and explained to equipment operators to assure that construction practices meet the intent of avoiding or minimizing impacts to the identified sensitive natural areas. In addition to the plans, the proposed access ways and water/wetland crossing locations, as well as other environmentally sensitive areas where activities will be restricted or prohibited, will be flagged and/or have signs posted.

Prior to crossings or construction in or near any sensitive natural areas, a "walk-through" will be conducted. Attendees at the walk-through will include: 1) the contractor, 2) CMP and/or any designated representative, and may include 3) any assigned Third Party Inspector. The purpose of the walk-through is to establish the following objectives, **prior to any clearing or construction work**:

- Identify available or alternate points of access to the project site.
- Identify sensitive natural areas.
- Identify future "No-Access" areas.
- Review color designation for all flagging used.
- Establish the Communication Chain of Command (Contact Point).
- Identify and flag access/construction roads within the ROW and/or project area.
- Establish methods of access over water resource areas (mats, timber corduroy, frozen ground, tracked equipment).

In order to minimize impacts to sensitive natural areas, the above objectives will continually be evaluated throughout the construction process. Project superintendents, foremen, and inspectors should also monitor weather conditions and reports on an on-going basis. Knowledge of changing or anticipated wet weather will allow time to address erosion control needs. In this way, CMP and its contractors will be prepared to respond to changing environmental conditions (e.g., unusually wet or dry weather) and other unknowns that are inherent in the construction and maintenance of transmission lines.

2.2 "Walk-Through" Mechanics

2.2.1 Use of Flagging and Signs

Flagging will be conducted at the time of the walk-through in order to visually identify select features or construction methods to be used. Wetlands may be flagged earlier as part of project permitting. Signs may also be installed following the walk-through to direct construction to approved access routes and away from "no access" areas. The CMP flagging color-code is as follows:

- ***Glow-pink*** with the printed words "Wetland Delineation", "Wetland Boundary" or "Wetlands". This flagging denotes the edge of wetlands.
- ***Red*** with or without the printed words – "Do Not Cross". This flagging denotes a No-Access area where no equipment is allowed.
- ***Yellow*** – no printed words. This flagging denotes the location of an environmental measure such as a waterbar, hay bale barrier, or silt fence.
- ***Blue*** – no printed words. This flagging denotes approved travel ways. This is typically flagged on each side of the access-way to denote the designated travel lane for all access.
- ***Glow-pink with black stripes*** or otherwise printed with the words Buffer or Wetland Buffer. This denotes a setback from a water resource and should be treated the same as No-Access area.

2.2.2 Identification and Use of Existing Roads

Available logging, farm, or access roads, as well as other existing rights-of-way, will be utilized for access to and from transmission line rights-of-way with permission of the respective landowners. In order to minimize ground disturbance, existing roads within the right-of-way and wetland/stream crossing areas will be used whenever possible for travel during construction, unless a better route is agreed upon during the walk-through. The movement of equipment and materials within the transmission line right-of-way will be confined as much as possible to a single road or travel path.

For example, it may be better to construct new access roads in order to: (1) minimize the span of a wetland or stream crossing, or (2) avoid the more environmentally sensitive or "wetter" portions of a wetland or stream crossing.

In all cases, CMP and its contractors will attempt to avoid and minimize impacts to sensitive natural areas. As a result of this procedure, wetland and stream crossings, steep slopes, unstable soils, and other sensitive natural areas will be avoided and adverse impacts minimized whenever practicable.

2.3 Construction Sequencing

Although a "Project Plan" may be specific in identifying the *locations* of water resource areas (wetlands, streams, etc.), and the *methods* of access over water resource areas (crane mats, frozen ground, etc.) it should not dictate *when* construction activities should occur. It would be impractical to include day to day activities in the "Project Plan" such as, 'pole X will be installed on Y date'. However, including environmental considerations in the daily and weekly project planning is very important. Factors such as the project schedule and weather often determine where and when construction activities occur; environmental impacts should also be considered. Below are some guidelines:

- Work closely with the individual(s) in charge of environmental compliance to plan project activities.
- Construction activities that cause soil disturbance should not occur during or just prior to forecast heavy rain events.
- Coordinate access planning with all of the contractors on the project. Often temporary access roads are used by several different contractors and the construction and use of temporary access roads can cause significant soil disturbance. Minimize equipment and vehicle travel on temporary access ways.
- Stabilize/restore disturbed areas as soon as possible, preferably while equipment is on site. Additional trips with equipment can create more soil disturbance which will need to be stabilized. Often a site can and should be stabilized within hours of when the soil disturbance occurred.
- Use frozen conditions to your advantage. There may be instances where water resource areas can be crossed during frozen conditions in lieu of installing crane mats. Before using this technique consult with the project environmental inspector.

- Crane mats should be removed as soon as they are no longer needed and/or when conditions are favorable.

3.0 STANDARDS FOR CONSTRUCTION

3.1 Road Construction

The following five standards apply to the construction and/or upgrade of all roads, skid trails, yarding areas, or work pads whether temporary or permanent.

1. Where construction will be located near water resources, such that material or soil may be washed into them, these disturbances will be set back from the edge of the water resource to maximize the amount of undisturbed filtering area between the disturbed area and the resource. These "filter strips" will consist of an area of undisturbed vegetation between the edge of disturbed area and/or silt fence/hay bale barriers placed to intercept any sediment load in runoff water before it can enter the resource area. In order to maintain the integrity and effectiveness of filter strips, sediment barriers should be installed very early in the construction sequence, and they need to be monitored to make sure they are functional. Effective filter strip widths may vary from only a few feet in relatively well drained flat areas to as much as several hundred feet in steeper areas with more impermeable soils. In steep terrain, additional erosion and sedimentation control measures will be installed at the low point where the work area drains into the filter strip when exposed soils exist and the flow path may result in channelization of runoff. The minimum width of the buffer strip shall be 25 feet or in accordance with local CEO or DEP regulations. The width of the filter strip shall be increased proportionately for slopes longer than 150 feet or for higher sediment concentrations. **Table 1** below provides the recommended widths for the filter strips according to the slope of land between the edge of the resource and any exposed soil.

Table 1
Recommended Widths For Filter Strips Between Disturbed Areas And Water Resources

Slope of Land Between Disturbance and the Resource (Percent)	Width of Filter Strip* (Feet)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165
*Measured along surface of the ground	

2. Wherever possible, construction equipment will either avoid steep slopes or proceed across the slope in a safe manner to avoid excessive disturbance of vegetation and soils. Equipment will not travel straight up or down any slopes with a grade steeper than 10 percent, except where necessary due to safety concerns and/or terrain constraints.
3. Where access roads or construction areas are to be built across the slope, the area will be properly sloped, slanting away from the cut bank to the outside edge of the roadbed in order to facilitate road surface drainage.
4. Slopes of cut-and-fill banks will be no steeper than 1 horizontal to 1 vertical. If located within 100 feet of water resources, the slopes will be no steeper than 2 horizontal to 1 vertical.
5. Rivers, streams, and wetland areas will be crossed, where necessary, at right angles to the channel and/or at points of minimum impact. To insure that natural drainage patterns will not be altered or restricted as a result of construction activities, crossings will be designed and constructed according to specific standards outlined below.

3.2 Stream or Wetland Crossings

The following standards apply to all unavoidable stream, drainage way, or wetland crossings encountered while accessing the project site or on the project site itself.

3.2.1 Types of Crossings Used

The type of crossing used for access is dependent on: the purpose and use of the crossing, the nature of the resource being crossed, ground conditions present at the time of construction, and construction materials available. Some planning guidance is provided below. The appropriate means and location of the crossing will be determined at the time of the formal walk-through. It is important to consult with the project environmental inspector prior to installing any crossing.

- Permanent culverts and bridges will be used only where long-term, continued, and frequent access is required (such as substation access roads).
- Temporary crossings will be used at all other locations. Temporary bridges, culverts, or crane mats must be used to cross any streams, drainage ways, or wetland swales that contain: (1) flowing water, (2) standing water, (3) saturated soils, or (4) organic/mucky soils.
- The use of corduroy as crossing material will be limited to wetlands which are not anticipated to have flowing or standing water during the construction period.
- In certain cases, no crossing material will be required if the stream bottom or drainage way is dry and contains a gravel or solid rock bottom (a “ford”). Fords can only be used if they will cause no unreasonable sedimentation of the stream and no unreasonable alteration of the stream banks and bottom.
- All crossings should include water bars or broad based dips or turn outs on the access, appropriately spaced on each side of the crossing, to promote filter-strip treatment of runoff. Consult Table 4 on page 12 of this document for specific water diversion structure spacing standards.
- All temporary crossings must be stabilized within seven (7) days of its removal, unless specified otherwise.

3.3 Construction in Wetlands

Where structures are to be placed in wetlands, topsoil must be excavated first, and stockpiled separate from subsoil. Be sure that stockpile soils are placed in such a manner that they are readily replaced into the excavated area. Soils shall be replaced into the excavated area in the opposite order they were removed. Excavation and pole placement in wetland areas should be completed within the same day. After pole installation, topsoil must be restored to the original surface grade, except where mounding around a structure is necessary for structure stability.

4.0 INSTALLATION OF CROSSINGS

4.1 Bridges

Bridges are a preferred method for temporary access waterway crossings. Normally, bridge construction causes the least disturbance to the waterway bed and banks when compared to the other waterway crossing methods. Most bridges can be quickly removed and reused without significantly affecting the stream or its banks and without interfering with fish migration.

Materials
Access bridge construction typically entails the use of log stringers as construction materials.

Sizing
Table 2 below illustrates the log sizing requirements depending on the span and anticipated loads.

Table 2
Log Bridge Stringer Requirements

Span	Minimum Log Diameter* (80,000 lb. Load)	(40,000 lb. Load)
8 ft.	16 in.	12 in.
12 ft.	18 in.	14 in.
16 ft.	20 in.	16 in.

Wheel guards: 10” diameter
- Size of deck planks: 4” x 12” x 12’
* Assume 6 stringers at 24” centers

Positioning
The following is guidance for the positioning and installation for all permanent and temporary bridges:

- Access roads will cross streams at right angles to the channel at a location with firm banks and level approaches whenever possible.
- Bridge piers and abutments will be aligned parallel to the stream flow so that the original direction of stream flow is not altered.
- Piers and abutments will be imbedded in good foundation material. The grade of the bridge should coincide with that of the road wherever practicable.

For additional specifications on bridge construction, refer to section F-2 of the Maine Erosion and Sediment Control BMPs (see full citation in Appendix C).

4.2 Culverts

Materials
Permanent culverts will be either corrugated metal or plastic pipe. Temporary culverts will be corrugated metal, plastic pipe, or lumber ties. Chemically-treated wood will be not used.

Sizing
Permanent culverts will be sized to have a diameter of at least 3 times the cross-sectional area of the stream channel or will be designed to accommodate 25-year frequency flows. Multiple culverts may be used in place of one large culvert if they have the equivalent capacity of a larger one. A culvert sizing criteria table (3x Rule) produced by the MDEP can be found in Appendix G. However, it is recommended that an engineer be consulted when installing any permanent culvert.

Temporary culverts will also be sized to provide an opening at least 3 times the cross-sectional area of the stream channel and sized to accommodate a 25-year frequency storm flow. The stream channel cross-section will be determined at highest flows or will be approximated during periods of lower flows using the apparent natural high water marks remaining on the stream banks. For small intermittent streams, drainage ways or wetland crossings, the minimum sized culvert that may be used is 18 inches. Multiple culverts may be used in place of one larger culvert if they have the equivalent capacity of a larger one.

Positioning
The following is guidance for the positioning of all permanent and temporary culverts:

- Culverts should be placed to allow for the crossing to take place at right angles to the channel to assure that natural drainage patterns will not be altered.
- Culverts should be placed at the point of narrowest crossing and where firm banks and level approach slopes are available. Slopes should be no greater than 1.5 to 1.

Installation
The following is guidance for the installation of all permanent and temporary culverts:

- Culverts should be of sufficient length to allow both ends to extend at least one foot beyond the toe of any fill used to cover the culvert.
- Inlet and outlet armoring shall extend at least one pipe diameter beyond the upstream and downstream end of the culvert. See Table 3 below for outlet protection in erodible areas.
- Culverts should be bedded on firm ground. Supplemental use of geotextile with gravel can be used to create this firm base. Permanent culvert installation should include firm compaction of the foundation and the fill around the sides of the culvert. Compaction should be done in no more than 8-inch lifts.

- Both the inlet and outlet ends of the culverts will be set at or slightly below the natural stream bottom to allow passage of fish and other aquatic life at all levels of flow. At no point should either end of an installed culvert be positioned in the air out of the water.
- Multiple culverts must be offset in order to concentrate low flows into the culvert within the natural channel.
- When working in and around a perennial stream, temporary stream diversion may be necessary to avoid creating turbidity in the stream water. This type of work requires a permit from Maine DEP, and must be coordinated with the project environmental inspector.
- Fill used to bury the culvert will be compacted at least half-way up the side of the culvert for its full length in insure that flowing water will not undermine the culvert.
- Culverts will be covered with fill to a depth of at least one foot or one and a half times the culvert diameter, whichever is greater.
- Road fill at the upstream (headwall) and downstream (out-fall) ends of culverts will be armored with either rock rip rap or logs to protect the road fill from being eroded by the action of water or road traffic. This material will be installed up to the level of anticipated high water.
- In areas where the streambed appears highly erodible, the streambed at the outlet end of the culvert will be lined with riprap to prevent erosion and potential stream bed scour. Table 3 below indicates the distances away from the culvert to install such riprap.

Table 3
Culvert Size - Length of Rock Protection

Culvert Diameter (Inches)	Length of Rock Protection From Culvert (Feet)
12 – 20	7
21 – 24	9
30	11
36	13
42 – 48	18
54 – 60	24
66 – 78	32

Removal

Temporary culverts will be removed once their use is no longer necessary. The fill material can be redistributed and spread out on the nearby uplands at a distance sufficient to prevent its reentry into the resource. Silt fence/hay bales, seeding, and mulching may be necessary to stabilize this material. The banks and bottoms of the stream, drainage way, or wetland should be restored to original conditions. Exposed soils on the banks and within 100 feet of the crossing should be stabilized using seed and mulch. Some banks and steep slopes adjacent to streams may require stabilization with curlex or jute matting in combination with seed and mulch.

4.3 Mats (Crane or Swamp Mats)

CMP construction projects require that adequate mats are present at the project site prior to construction. A readily accessible source of mats should also be available in case construction conditions change and necessitate the need for more mats.

Materials

A number of different sized and constructed crane mats are typically available. CMP requires that the appropriate mats be used for the appropriate crossing. For example:

- Longer mats should be used for the longer crossing spans. This practice avoids the need to install additional mats within the crossing area in order to support the "span" mats.
- Mats should be in good condition to allow for their "clean" installation. Having mats in good condition prevents them from being dragged in versus them being carried in due to broken hitching cables, breaking apart on the job site, or becoming imbedded in mud due to their inability to support the required weight.
- Mats with partial/short timbers joined end to end should generally not be used to cross stream channels.

Installation

- Whenever possible, mats should be carried and not dragged. Dragging mats creates more soil disturbance which requires additional erosion control or final restoration work.
- At the crossing location, the ends of the crane mats should extend at least two feet onto firm banks or several feet into the upland edge of a wetland to assure a dry, firm approach onto the mats.
- At crossings which contain open or flowing water, the mats should be supported within the span using cross mats as abutments in order to prevent the impoundment of water or having water flow over the mats.
- At "dry" crossings where no water is present or anticipated during project construction, the mats may be placed directly onto the sensitive natural area in order to prevent excessive rutting, provided stream banks and bottoms are not altered.

Maintenance

Matted crossings should be continually monitored to assure their correct functioning. Mats which become covered with dirt should be kept clean and the material removed must be disposed of in an upland location. The material must not be scraped and shoveled into the water resource. Mats which become imbedded must be reset or layered to prevent mud from covering them or water passing over them.

Removal

Mats should not be removed until their use is absolutely no longer necessary. Specifically, all final restoration work should be completed prior to the mats being removed from the crossings. The planned removal of mats should be coordinated with CMP (or designated representative), the project environmental inspector, and any Third Party Inspector. As temporary structures, they should be removed within one year from the date of installation. All areas disturbed during ford removal shall be stabilized with seed and mulch.

4.4 Corduroy

Materials
Corduroy material will consist of de-limbed trees or logs. The logs must have a diameter greater than three inches at the small end and lengths greater than 18 feet. Shorter length material may be used only as described in the Installation section below.

Positioning
Corduroy should be placed perpendicular to the direction of travel. Corduroy should be placed at the point of narrowest crossing and where firm banks and level approach slopes are available.

Installation
The corduroy should be placed with the longer length pieces laid down first. The bed of corduroy should not only be placed within the low portions of the crossing but also for at least three feet up the sides of any upland side slopes in order to prevent rutting and sedimentation from the approaches to the crossing.

Once a thick base of corduroy has been laid, pieces shorter than 18 feet can be used to fill gaps and raise the elevation of the corduroy to provide for a more stable crossing.

Removal
Removal is the reverse of installation. Once the corduroy has been removed from the crossing, it may be moved off the right-of-way, burned, or chipped. The material may also be spread and distributed on the ROW over the nearby upland if in accordance with the Maine Slash Law (see Appendix E) and approved by a CMP representative. The banks of streams and drainage ways must be graded back to original conditions. Exposed soils on the banks and within 100 feet of the crossing must be stabilized using seed and mulch. Banks of drainage ways that are expected to receive high flows should be stabilized with seed and curlex or jute matting.

5.0 SURFACE WATER DIVERSION STRUCTURES (WATER BARS)

A number of above-ground structures or techniques are available to divert water out of travel ways and work areas in order to prevent subsequent runoff and erosion. The terminology and definitions for these techniques (i.e., broad-based dips, water bars, skid humps, water turnouts, and cross-drainage box culvert) vary, but the purpose of all is to redirect water moving down a slope into adjacent vegetated areas (filter strips). Any activities that involve land grading have the potential to cause sedimentation. Their use and installation needs to be carefully planned. Planning for these techniques must include timing, use of natural buffers (filter strips), mulching, and temporary and permanent seeding. Minimizing the area of soil exposed at one time is a key component of ensuring that surface water diversion structures function effectively. General standards for their construction are as follows.

Materials
Most of these structures are constructed by excavating or moving and shaping earth from within the access way or work area. The cross-drainage culvert structure typically uses logs or timber to form a box-like structure to catch water from travel ways or side ditches in order to direct it across the travel way and away from disturbed areas.

Positioning

These structures should be installed immediately above and along steep pitches in the road and below seepage areas on natural or cut banks; be sloped away from the travel surface and be sited to take advantage of existing vegetation for filtering. In some areas of exposed soils, the right-of-way might be sloped such that runoff traverses the disturbed area. In these areas, temporary water diversions should be deployed to divert the upgradient runoff away from the disturbed work area and towards a stable drainageway. The interval for installing these diversion structures depends on the slope of the road, as well as the nature of the road surface, soils, and wetness. Generally speaking, steeper slopes require shorter distances between diversion structures. The following table contains recommended distances between installed structures depending on slope.

Table 4
Recommended Distances Between Water Diversion Structures

Slope (Percent)	Spacing (Feet)
2	250
5	135
10	80
15	60
20	45
30	35

All of these structures should be sized in anticipation of greater flows resulting from snow melt, spring runoff, and storm rains.

Installation

These structures should be installed at 30-degrees angled down grade. The shape of the backside portion of the structure should have a reverse slope of about 3 percent. Use of a pop-level is recommended to ensure that drainage is away from the road. Structures should be constructed with rounded (not vertical) mounds and dips to allow for firm compaction and to allow re-vegetation.

In the case of the cross-drainage culvert, the minimum width of the open face of the culvert should be 18 inches. The travel surface should consist of at least 12 inches of gravel or soil over the culvert. The slope of the culvert should be a drop of at least 5 inches in every 10 feet of length to ensure proper drainage.

The inlet end of all structures should extend beyond the edge of the access road so that it fully intercepts water flows that may flow onto the access road. The outlet end of the structure should extend out enough to prevent water from flowing around and re-entering the road or work area.

The discharge ends of any of these diversion structures should outlet into a vegetated filter strip. Where heavy flows are encountered or anticipated, the outlet end of the structures should incorporate an apron of rock, gravel, or brush to reduce water velocities. If construction will

extend into fall and winter months, be sure to upgrade to meet winter standards all erosion control measures (e.g., increase amount of mulch, etc.), to protect the site from spring runoff.

Where the structure is within 100 feet of a stream or wetland, the incorporation of a small, excavated settling basin or ditch turnout to reduce the velocity of flows and the continued movement of sediment downslope should be considered. In addition, some type of sediment barrier (silt fencing or staked hay bales) will be installed at the outlet of the diversion structure, where vegetated filter strips are narrow or sparsely vegetated, in order to prevent sediment from eroding into water resources.

Maintenance

Due to repeated travel over these structures, maintenance is critical to their effective functioning. As the structure becomes flattened or rutted, it needs to be re-excavated or graded to ensure the interception and redirection of water runoff. The ends of any cross-drainage culverts should be maintained by clearing away any potential blockages.

Removal

After the completion of the construction project, removal of these structures is not a requirement, with the exception of the cross-drainage culvert. The structures can be left in place provided they have been suitably stabilized with seed and mulch. Any hay bale barriers or silt fence at the outlet end should be removed when the site has a healthy vegetative cover.

6.0 SEDIMENT BARRIERS (STRUCTURAL MEASURES)

6.1 Introduction

The use of properly installed erosion and sediment control barriers is a fundamental and critical component for preventing erosion at CMP construction projects. Erosion control barriers include silt fence, hay bales, and/or erosion control mix berms. In some cases, these barriers may be deemed unnecessary by CMP, its representatives, or a Third Party Inspector due to factors including slope and filter strip width within project boundaries. A typical CMP construction project will use a combination of barriers to effectively control erosion near water resources. Installation and diligent maintenance of these barriers serves the following purposes:

- Assures the environmental integrity of those upland and water resource areas not designated or permitted for disturbance. Specifically, it maintains the onsite vegetative community and water quality of the surface water within the watershed.
- Assures compliance with all applicable federal, state, and local environmental and land use regulations or permit conditions.

Generally, silt fence is the preferred barrier because: it traps a much higher percentage of suspended sediments than hay bales; it can be easier to install, obtain, and transport; and is less costly. In addition, the structural longevity of silt fence is 60 days or longer unlike straw or hay bales' longevity which is 60 days or less.

The standards and procedures outlined in this section of the manual are meant to address a majority of the situations encountered during transmission line and substation construction activities. For additional information on sediment and erosion control methods and techniques, or to address a particularly problematic situation, this manual should be used in conjunction with and supplemented by the Maine Erosion and Sediment Control BMPs. For other recommended references, see Appendix C.

6.2 Silt Fence

Materials

Silt fence is provided by a number of manufacturers and is generally a synthetic fabric pre-attached to wooden staking. The fabric should be pervious to water allowing a flow through rate of 0.3 gallon per square foot per minute. The fabric should contain stabilizers and ultraviolet ray inhibitors to allow it to sustain exposure of a minimum of 6 months. The height of the filter fabric should not exceed 4 feet in height.

Placement

Silt fence is to be utilized at the edge of any planned work area or area which will cause the disturbance of soil. It will be installed to intercept any sheet flow of water and detain sediment from entering water resources or leaving the project site. It should be installed prior to starting work. Given the expansiveness of CMP transmission line projects in particular, the amount of silt fence placement must be selective; however, it should still be used in amounts sufficient to meet potential changing conditions in a pro-active manner. After the primary stabilization measures (temporary and permanent) have been implemented, silt fence use is encouraged in the following selected locations, as appropriate:

- Around all substation project sites.
- Along all access roads or work areas that are within 100 feet of water resources.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of silt fence is appropriate when:

- Serving a drainage area of no more than .25 acre per 100 feet of silt fence length.
- The maximum slope length behind the fence is 100 feet or less.
- The maximum gradient behind the fence is 50% or 2:1 horizontal/vertical.
- Where the filter strip is not of an adequate width (see Table 1).

Installation

The following installation guidelines are the minimum which should be implemented; however, appropriate changes to silt fence installation should be made as conditions change during the construction operation.

Silt fence will be placed an adequate distance (6-10 feet) beyond the toe of the slope (if there is sufficient room) to allow for sediment accumulation between the disturbed area and the down-

gradient water resources. If there is not sufficient room to place the silt fence an adequate distance beyond the toe of the slope, CMP, a representative of CMP, or the Third Party Inspector should be consulted. The barrier should be installed along the contour, within reason. The goal is to slow and pool the sediment-laden runoff to allow fine sediments to settle-out before the runoff enters the water resource. The ends of the barrier should be up-turned to maintain the pool volume.

A trench shall be excavated approximately 6 inches wide and 6 inches deep on the up-slope side of the silt fence alignment. The lower edge of the silt fence fabric should be entrenched for a distance of at least 4 inches up-slope and then back-filled. Should frozen or rocky ground conditions prevent the effective or practical use of trenching, materials such as bark/wood chips, wood fiber mulch, or a soil erosion control mixture can be used. This material is to be mounded on top of at least 4 inches of filter fabric which would otherwise be trenched.
Silt fence should be installed in a continuous roll to avoid the need of a joint between different pieces of fence. If joints are necessary, filter fabric shall be "spliced" together at a support post, securely sealed, and with a minimum of 6 inches of overlap. Splicing rolls of silt fence entails twisting end posts together, creating a continuous section of silt fence.

Support posts should be placed on the down-slope side or the side closest to or facing the water resource. The posts should be placed 6 feet apart (a maximum of 10 feet may be acceptable in some locations) and driven securely into the ground, typically about one foot deep. Silt fence usually has posts pre-attached.

Silt fence should not be installed in streams or drainage ways where concentrated water flow is present or concentrated flows are anticipated.

Maintenance
Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor is responsible for inspecting all temporary erosion and sediment control barriers. Such inspection is necessary to assure that the barriers are functioning properly as well as identifying new areas requiring installation. A maintenance log should be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they will be repaired or replaced. A sediment control barrier is not functioning if:

1. Water is flowing around the sides or under the barrier.
2. Soil has built up behind the barrier to the point more than half-way up the fence.
3. There is excessive sag in the fence.
4. There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the perimeter silt fence.

Corrective measures include removing accumulated sediment from behind the barrier, restaking, extending the ends of the fence, or installing another fence further upslope.

Removal
Installed silt fence will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists. In most cases, the silt fence will not be removed until at least one growing season has past. Removal of silt fence should be coordinated with CMP or their designated representative.

Any ridges or mounds of soil or caught sediment remaining in place after the silt fence has been removed, must be leveled-off to conform to the existing grade. Any newly exposed soil that may erode must be seeded and mulched.
All removed silt fence must be properly disposed of off the project area.

6.3 Hay Bales

Placement
Like silt fence, hay bale barriers can be utilized at the edge of any planned work area or areas where soil disturbance has occurred or will occur. Barriers are installed to intercept sheet flow of water and detain sediment from entering water resources or leaving the project site. Given the expansiveness of CMP transmission line projects in particular, the amount of hay bale barrier placement must be selective, but still in amounts sufficient to meet potential changing conditions in a pro-active manner. Hay bale barriers will be used, as appropriate, in the following locations:

- Around all substation project sites.
- Along all access roads or work areas that are within 100 feet of a water resource area.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of hay bales is appropriate when:

- Serving a drainage area of no more than .25 acre per 100 feet of barrier length.
- The maximum slope length behind the barrier is 100 feet or less.
- The maximum gradient behind the barrier of 50% or 2:1 horizontal/vertical.
- Where the filter strip is not of an adequate width (see Table 1).

Installation
The following installation guidelines are the minimum which should be implemented; however, appropriate changes to hay bale installation should be made as conditions change during the construction operation.

The barrier will be placed an adequate distance (6-10 feet) beyond the toe of the slope (if there is sufficient room) to allow for sediment accumulation between the disturbed area and the down-gradient sensitive areas. If there is not sufficient room to place the hay bales an adequate distance beyond the toe of the slope, CMP, a representative of CMP, the project environmental inspector, or the Third Party Inspector should be consulted. Within reason, the barrier should be installed along the contour. The goal is to slow and pool the sediment-laden runoff to allow fine

sediments to settle-out before the runoff enters the water resource. The ends of the barrier should be up-turned to maintain the pool volume.

A shallow trench shall be excavated the width of the bale and to a minimum depth of 4 inches in which to bed the bale. The excavated soils are then used to seal the lower inside (up-slope) edge of the barrier. The bales should be set tightly together and entrenched with the baling string oriented on the sides (i.e., not touching the ground) in order to prevent deterioration of the string.

Every bale should be staked using 2 stakes per bale. The stakes should be driven in at angles such that it binds and forces abutting hay bales together.
Gaps between bales shall be packed with loose hay to prevent water from escaping between the bales.

Hay bales will not be placed in streams where flow is present or anticipated.

Maintenance
Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor is responsible for inspecting all temporary erosion and sediment control barriers. Such inspection is necessary to ensure the structures are functioning properly as well as identifying new areas requiring installation. A maintenance log should be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they must be repaired or replaced. A sediment barrier is not functioning if:

- Water is flowing around the sides or under the barrier.
- Soil has built up behind the barrier to the point more than half-way up the hay bale or where there is excessive lean to the barrier.
- There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the hay bale barrier.

Corrective measures include removing accumulated sediment from behind the barrier, re-staking, extending the barrier at the ends, or installing another barrier further up-slope.

It is not recommended that straw or hay bales be used for periods greater than 60 days.

Removal
Installed hay bales will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists. In most cases, the hay bale barrier will not be removed until at least a healthy growth of vegetation is established on the disturbed site. Removal of hay bale barriers should be coordinated with CMP or their designated representative.

Any ridges, mounds of soil, or caught sediment remaining in place after the hay bales have been removed, must be leveled-off to conform to the existing grade. Any newly exposed soil that may erode must be seeded and mulched.

All removed hay bales must be properly disposed of, or broken up and used as mulch on the bare soils near the barrier.

6.3.1 Problems With Straw or Hay Bale Barriers

There are several situations where straw or hay bale barriers may be ineffective or cause problems:

1. When improperly placed and installed (such as staking the bales directly to the ground with no soil seal or entrenchment), hay bales allow undercutting and end flow.
2. When used in streams and drainage ways, high water velocities and volumes destroy or impair their effectiveness.
3. When bales are not inspected and maintained adequately.
4. When hay bale barriers are removed before up-slope areas have been permanently stabilized.
5. When hay bale barriers have not been removed after they have served their usefulness.

6.4 Erosion Control Mix Berms

Composition

Erosion control mix berms are made up of shredded bark, stump grindings, and composted bark. It may be made on a project site if adequate materials are available, however its composition needs to be a well-graded mix of different particle sizes. Wood chips, bark chips, ground construction debris and processed wood cannot make up the organic component of the mix. Be sure to consult with the project environmental inspector regarding the suitability of any erosion control mix material proposed for use.

Installation

Erosion control mix berms are simply placed on the surface of the ground and do not require any soil disturbance. The berm should be located in a similar manner to other sediment control barriers along contour, downslope of disturbed soils. Also similar to other sediment barriers, they should not be placed in areas of concentrated runoff, below culvert outlets, around catch basins, or at the bottom of a large contributing subwatershed. At the toe of shallow slopes less than 20 feet long, at a minimum berms should be 12” high and a minimum of 2 feet wide at their base. For longer or steeper slopes, the berms should be wider to accommodate additional runoff. They are ideal for installation on frozen ground, on shallow to bedrock soils, outcrops of bedrock, and heavily rooted forested areas (i.e., those areas where other barriers are difficult to install).

Erosion control mix can also be placed in a synthetic “sock” to create a contained stable sediment barrier. This is especially useful in areas where trenching is not feasible, such as frozen ground, across pavement, or compacted gravel. When in a sock, erosion control mix can staked in an area of concentrated flow (i.e., ditch or swale) as the netting prevents movement of the mulch mixture.

Maintenance
As with other barriers, inspection should be performed after each rainfall or daily during prolonged periods of rain. Accumulations of sediment should be removed when they reach half the height of the barrier, and the berms can be reshaped and new material can be added as needed.

Removal
In most cases, erosion control mix berms do not need to be removed. They will continue to function as they decompose, become part of the soil on the site and will naturally revegetate. If synthetic socks are used, the erosion control mix can be emptied from the sock and the socks can be disposed of offsite.

6.5 Temporary Sediment Traps

Temporary sediment traps function to slow or temporarily detain runoff and allow sediment to settle out of the water column prior to runoff leaving a project site. Sediment traps generally consist of natural or manmade depressions. Sediment traps are not designed for high volume or high velocity flows.

Installation
Areas draining to sediment traps should be relatively small. Sediment traps are routinely installed at the discharge end of a water bar or upgradient water diversion to treat runoff. Natural depressions can be used or modified, and small basins can be excavated. Structural erosion control devices can be installed along the downslope perimeter of natural or excavated sediment traps to increase filtration of any runoff that overtops the trap. Sediment traps should discharge to vegetated buffer areas.

Sediment traps may also be constructed using structural erosion controls such as hay bale corrals lined with geotextile fabric. Care should be taken to prevent existing vegetation or obstructions from tearing the fabric and allowing the runoff to escape the fabric untreated.

Maintenance
When sediment has accumulated to 50% of the capacity of the trap it should be removed and placed in an upland area and stabilized in a manner to prevent its entry into protected natural resources. Similarly, non-functioning or damaged geotextile fabric must be removed, disposed of properly and replaced as needed.

Removal
Temporary sediment traps shall be removed, and areas shall be regraded to original contours and stabilized with permanent non-structural controls until fully re-vegetated. All structural controls used to construct temporary sediment traps must be removed and disposed of properly.

6.6 Temporary Sediment Basins

Permanent sediment basins, designed by a qualified engineer, can be used during construction for temporary storage of stormwater and settling of sediments. Sediment basins should be constructed and stabilized prior to the remainder of the site being disturbed. Flow patterns across the site should be directed towards the sediment basin for treatment.

Installation of the sediment basin shall be completed per the design on the engineer-stamped drawings. Following its use as a temporary sediment basin, all collected sediment must be removed and necessary repairs made to allow for the intended permanent function of the engineered design. Sediments removed from the basin must be placed in an upland area and stabilized in a manner to prevent its introduction into protected natural resources.

7.0 NONSTRUCTURAL EROSION CONTROL MEASURES

7.1 Nonstructural Measures Defined

Nonstructural measures are temporary or permanent methods used to cover exposed soil areas to prevent erosion from occurring. Their purpose is to cover whole areas of exposed soil to prevent initial erosion of soil from a construction site.

Examples of nonstructural measures include hay or straw mulch, erosion control mix, matting, or seeding.

7.2 Importance of Nonstructural Measures

Nonstructural measures are important because they provide both temporary and permanent protective cover to exposed soils. Generally, they provide the first line of protection against erosion, and can be the most effective means of preventing erosion. This protection is important because exposed soils are easily eroded by wind or water. Some soils such as silts can easily be removed from a construction site by rainwater. The impact of individual raindrops on exposed soils can loosen soil particles, and these particles can then be carried off the work site by runoff and deposited into water resources including streams, rivers, wetlands, ponds, and lakes. Silt particles don't settle out of water easily, and water siltation can pollute surface waters and harm aquatic creatures such as insects and fish. For example, brook trout, one of Maine's premier game fish species, requires clear, high quality water in order to survive. Silty water can reduce spawning habitat, irritate fish gills, lower oxygen content in water, and make fish susceptible to diseases.

Dry soil conditions and high winds can also cause siltation. When small particle soils such as silts become dry, they have a baby powder-like texture and can easily be swept away by winds. Nonstructural measures help prevent wind erosion because they hold moisture next to the soil, keep the soil from drying out due to wind exposure, and prevent winds from carrying away dry soil particles. Keep in mind, however, that proper construction sequencing is invaluable (See Section 2.3).

7.3 Placement of Nonstructural Measures

Nonstructural measures should be used whenever there is a possibility that exposed soils on a construction site could wash into adjacent sensitive water resources. Temporary nonstructural measures such as hay or straw mulch should be spread on exposed soils within 100-feet of water resources within 48 hours of initial soil disturbance, or before any predicted storm event. There are two types of nonstructural measures: temporary and permanent. Temporary measures are typically used during construction, while permanent measures are usually applied after construction is complete (i.e., restoration). Provided below are general discussions and explanations of the common nonstructural measures that are used on CMP construction sites.

7.3.1 Temporary Measures

- Hay or straw mulch (unanchored on slopes less than 8%, anchored on slopes greater than 8%) on exposed soil areas and soil stockpiles in the construction area.
- Temporary seeding covered by hay or straw mulch on soil stockpiles or areas of exposed soil next to sensitive resources that are not scheduled for final restoration for 30 days (this only applies between the dates of April 16 to October 31 of any given year). Temporary seeding is not required during the Winter Construction Season.
- Erosion control mix can be used as a stand-alone temporary mulch on slopes that are 2 horizontal to 1 vertical, or less, on frozen ground, in forested areas, or at the edge of gravel parking and areas under construction. It should be applied at a thickness of 4 to 6 inches.
- Rolled Erosion Control Products (RECP's) such as Curlex or Jute matting, can be used on areas of high wind exposure, steep slopes (steeper than 8% grade), unstable soils, and stream/river bank restoration areas. Matting is typically anchored (usually with large staples, as recommended by the manufacturer). Although this type of material is usually used during final restoration, it is considered a temporary measure because it generally deteriorates within two years.

Table 5
Temporary Seeding Rates and Dates

Seed	Lb./Ac	Seeding Depth	Recommended Seeding Dates	Remarks
Winter Rye	112(2.0 bu)	1-1.5 in.	8/15-10/1	Good for fall seeding. Select a hardy species, such as Aroostook Rye.
Oats	80 (2.5 bu)	1-1.5 in.	4/1-7/1 8/15-9/15	Best for spring seeding. Early fall seeding will die when winter weather moves in, but mulch will provide protection.
Annual Ryegrass	40	.25 in.	4/1-7/1	Grows quickly but is of short duration. Use where appearance is important. With mulch, seeding may be done throughout growing season.
Sudangrass Perennial	40 (1.0 bu) 40 (2.0 bu)	.5-1 in. .25 in.	5/15-8/15 8/15-9/15	Good growth during hot summer periods. Good cover, longer lasting than Annual Ryegrass. Mulching will allow seeding throughout growing season.

Temporary mulch with or without dormant seeding			10/1-4/1	Refer to TEMPORARY MULCHING BMP and/or PERMANENT VEGETATION BMP.

Proper application rates, location, and seasonal consideration are provided in Table 6 on page 23 of this manual.

7.3.2 Permanent Measures

Uplands

- Permanent grass and legume seeding covered by hay or straw mulch on all areas that have been restored to final grade (this seeding generally applies between the dates of April 16 to October 31 of any given year). This is required to establish permanent, perennial, vegetative cover on exposed soils. Permanent seeding is not required during the Winter Construction Season, although dormant seeding may be performed. (See Section 8.0 for details on winter construction.)
- Seeds covered by anchored (usually with large staples) Curlex or jute matting in areas of high wind exposure, on steep slopes (steeper than 8% grade), unstable soils, and stream/river bank restoration areas.
- The soil may need to be properly prepared before any seeds are placed on the ground. This preparation may include addition of fertilizer (only in designated upland areas not adjacent to, or near waterbodies or wetlands, if in doubt ask the environmental or construction inspector) in areas that have been tested, and are found to be deficient in plant nutrients.
- Erosion control mix can also be used as a permanent mulch to provide a buffer around disturbed areas. It can be left in place to decompose and naturalize. It will eventually support vegetation, which should be promoted. If vegetation is desired in the short-term, legumes and woody vegetation can be planted, which will create additional stability.

Wetlands

- Wetland areas are to be seeded only with resource agency approved wetland seed mixes. If it is decided that wetlands will not be seeded, disturbed wetland will be graded to original contours, mulched with straw, and allowed to revegetate naturally.

As with the Temporary Measures, refer to Table 6 on page 23 for proper application rates, locations, and seasonal considerations.

For permanent seeding mixtures, consult the approved plans/proposal for the project, the environmental inspector, or Appendix A of the Maine Erosion and Sediment Control BMPs.

8.0 WINTER CONSTRUCTION CONSIDERATIONS

If a project is actively being constructed between November 1 and April 15 of any given year, sediment and erosion control guidelines developed by the Maine Department of Environmental Protection for projects occurring during the winter months must be followed.

Proper construction sequencing (Section 2.3) can greatly minimize environmental impact during winter construction. When in doubt, contact the project construction manager or environmental inspector with any questions.

Table 6 on page 23 highlights some of the major differences between the winter construction guidelines and normal BMPs used during construction and for temporary stabilization. The table presents differences for temporary measures that should be used during construction, and permanent measures when construction is completely done.

Table 6
Nonstructural Erosion Control Measures (Seasonal Differences in Construction BMP Requirements)

Dates	General Construction April 16 through October 31 of every year	Winter Construction November 1 through April 15 of every year
Mulch on slopes less than 8%	Within 100-feet of sensitive water resources apply hay and/or straw mulch at a minimum of 70 lbs./1000 square feet of exposed soil (about 2 bales). Must be done within 7 days of initial soil disturbance and before storm forecasted events, unless specified otherwise.	Within 100-feet of sensitive water resources apply and maintain properly anchored hay and/or straw mulch at a minimum of 150 lbs./1000 square feet of exposed soil (about 5 bales) at all times. (double the April 16 – October 31 rate)
Mulch on slopes greater than 8%	Hay or straw mulch can be applied without being anchored, though specific site conditions may require use of anchoring.	Apply mulch as specified above. Properly anchor with Curlex, jute matting, or similar mulch netting on upland slopes exceeding 8% and within 100 feet of streams if no construction activities are anticipated for 7 or more days.
Area of exposed soils allowed at any one time	No restriction on area exposed, but contractor must attempt to minimize amount of exposed soil at any one time, especially next to water resources.	Not more than one (1) acre of exposed (not mulched or otherwise devoid of vegetative cover) soil.
Sediment barriers	A single line of sediment barriers including silt fence, hay bales, or wood waste filter berms must be installed between water resources and disturbed soils.	If soil is frozen, wood waste filter berms **or** 2 lines of sediment barriers (including hay bales and silt fence) must be placed between water resources and disturbed soils.
Temporary seeding in uplands	If required, apply at the rate specified by the supplier, CMP Environmental Department, or Environmental Inspector. Cover with mulch.	Not required, but if temporary seeding is desired, it must be applied at a rate 3 times higher than the General Construction Season, and covered with mulch.
Temporary seeding in wetlands	Wetlands are not to be seeded unless done so with an agency-approved seed mix. Annual Rye Grass is not acceptable and shall not be used. Disturbed wetland areas will be mulched exclusively with straw.	Wetlands are not to be seeded unless done so with an agency approved seed mix. Annual Rye Grass is not acceptable and shall not be used. Disturbed wetland areas will be mulched exclusively with straw.
Permanent seeding in uplands	Site must be seeded at rate specified by the supplier and covered with hay or straw mulch. If needed, the site can be limed and fertilized.	Not required before April 16, but if dormant seeding is desired, the site should receive an adequate cover of loam, if necessary, be seeded at a rate 3 times higher than the General Construction Season, and covered with mulch at a minimum of 150 lbs./1000 square feet.
Permanent seeding in wetlands	Do not apply permanent seed mixes to wetland areas unless they are specially designated wetland seed mixes approved by a resource agency.	Do not apply permanent seed mixes to wetland areas unless they are specially designated wetland seed mixes approved by a resource agency.
Temporary seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-10-10 fertilizer may be applied at a rate of 600 lbs./acre and limestone at 3 tons/acre.	Not required, but seedbed can be prepared according to General Construction requirements.

Dates	General Construction April 16 through October 31 of every year	Winter Construction November 1 through April 15 of every year
Permanent seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-20-20 fertilizer may be applied at a rate of 800 lbs./acre and limestone at 3 tons/acre.	Not required before April 16, but if dormant seeding is desired, the seedbed can be prepared according to the General Construction requirements.
Temporary slope stabilization	Same as winter construction season, but mulch does not need to be anchored.	Anchored hay or straw mulch on slopes greater than 8% and drainage ways with greater than 3% slope as necessary. Wood waste mix can be used on slopes in place of anchored hay or straw mulch.
Maintenance of erosion controls	Same as winter construction guidelines.	All erosion controls should be inspected periodically to ensure proper function. If any evidence of erosion or sedimentation is evident, repairs should be made to existing controls or other methods should be used.
Inspection and monitoring	Monitoring should be performed as needed until a new, healthy vegetative cover is attained on the site. This applies to both temporary and permanent seeding.	Monitoring should be performed as needed to ensure proper stabilization and re-vegetation (both temporary and permanent). Starting in the spring following completion of the project, inspections should be performed until new, healthy vegetative cover is attained.

9.0 SITE RESTORATION STANDARDS

Following completion of the construction work, the contractor will be responsible for conducting site restoration work. The following guidelines will apply to all activities, including temporary and permanent roads, stream/wetland crossings, staging and work areas, and substation sites.

9.1 Procedure

At the completion of project construction in an area or at the end of the construction, CMP or their designated representative, the contractor, and any Third Party Inspector will review the project's restoration needs and prioritize the areas. This prioritization should consider time of year, ground conditions, re-vegetation probabilities, and equipment availability. A restoration "walk-through" is strongly recommended.

In many cases a site can and should be restored within hours of when the soil disturbance occurred. Often getting the equipment to a site that needs to be restored only creates more disturbed area to restore. It is important to "restore as you go" to reduce the equipment travel on temporary access roads. It can be particularly difficult to restore an area that was disturbed during winter construction activities in the spring or summer.

Likely areas of restoration include, but are not limited to:

- Around substation construction areas.
- Around pole and anchor pole placement.
- All wetland, stream, or brook crossings, particularly the approaches and any stream banks.
- Drainage ways or ditches.
- All temporary or permanent constructed roads, yarding, and staging areas.
- Cut banks.
- Steep slopes (over 8%).

9.2 Methods for Restoration

There are several methods of restoration for different areas.

1. All soil that is excavated, mounded, or deposited during construction will be re-graded or removed from the site as directed by CMP. All re-grading and redistribution of soil will be done to match existing grade.
2. The banks and bottoms of brooks, streams, and rivers will be restored to natural conditions. In general, any material or structure used at temporary crossings will be removed, and the bank and bottoms restored to their original depth and contour.
3. On permanent access roads, stream culverts and bridges will be left intact and in good repair to remain available for maintenance operations and/or public access (woods roads, camp roads, etc.).
4. On those construction roads to be closed to future vehicle traffic (as determined by CMP), bridges, culverts, and other temporary crossing or water diversion structures will be removed and the banks and bottoms restored to original conditions.

5. Previously installed water bars may remain or new ones will be installed at locations designated by CMP or their designated representative. To prevent accelerated soil erosion, such water bars will be installed on all access and construction roads to be closed to vehicle traffic and on steep sections of permanent roads. Permanent water bars will be constructed to a sufficient height and width to divert the amount of water anticipated at each location as well as to provide some post-project permanence to the site. Water bars on long-term temporary access roads will be constructed in such a manner that they will remain effective and require minimal maintenance, and will be permanently seeded to ensure their long-term stability.
6. All areas severely rutted by construction equipment will be re-graded and permanently revegetated.
7. Upon completion of the project, all disturbed areas will be permanently revegetated or otherwise permanently stabilized. This includes the restoration of all areas disturbed by pole installation, temporary access roadways, permanent access roadways, substation construction, and resource crossings. Restoration is generally assumed to be a well-established vegetative cover. All cut and fill slopes must be revegetated, stabilized with riprap, or stabilized with erosion control mix, as appropriate to the slope conditions.
8. Liming, fertilizing, and seeding requirements for permanent re-vegetation will depend upon the soil type and drainage condition of the site. In the absence of soil tests, permanent seeding will generally be done in accordance with “Procedures for Permanent Seeding for Erosion Control” found in Table 6 on page 23.
9. The contractor will be responsible for the proper maintenance of all revegetated areas until the project has been completed and accepted. Where seed areas have become eroded or damaged by construction operations, the affected areas will be promptly re-graded, limed, fertilized, and re-seeded as originally required.
10. The contractor will perform all erosion control work to the complete satisfaction of Central Maine Power Company before the work is accepted. Central Maine Power Company will base acceptance of the erosion control and stabilization work on a final inspection.

APPENDIX A

DEFINITION OF TERMS

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DEFINITION OF TERMS

Adjacent to a natural resource: Within 75 feet of, or in a position to wash into, a water resource (river, stream, brook, pond, wetland, or tidal area).
Annual seed mix: Seed mixture largely made up of plants that only persist one growing season.
Brook: Essentially the same as a stream, a water course that has a defined channel, a gravel, sand, rock or clay base, and flows at least part of the year. It may be a dry channel part of the year.
Corduroy: Logs greater than 3 inches in diameter at the small end and at least 18 feet long that are placed perpendicular to travel direction, on approaches to and in wetlands for crossings. The purpose of the logs is to prevent rutting and preserve vegetation root integrity in and adjacent to wetland areas. May also be used on approaches to mats or bridge stream crossings.
Crossing: Any activity extending from one side to the opposite side of a sensitive natural resource whether under, through, or over that resource. Such activities include, but are not limited to, roads, fords, bridges, culverts, utility lines, water lines, sewer lines, and cables, as well as maintenance work on these crossings. Crossings should be done to minimize impact. For example, crossing at a right angle to the resource and finding the driest or narrowest spot is one method for minimizing impact.
Cross-sectional area: The cross-sectional area of a stream channel is determined by multiplying the stream channel width by the average stream channel depth. The stream channel width is the straight-line distance from the normal high water line on one side of the channel to the normal high water line on the opposite side of the channel. The average stream channel depth is the average of the vertical distances from a straight line between the normal high water marks of the stream channel to the bottom of the channel.
Culvert: A pipe or box structure of wood, metal, plastic, or concrete used to convey water.
Erosion: Movement of earthen material by water or wind.
Erosion control blanket (matting): Manufactured material made out of natural or synthetic fiber designed to control movement of earthen material when installed properly.
Erosion control mix: Erosion control mix consists primarily of organic materials such as shredded bark, wood chips, stump grindings, composted bark, or similar materials. Ground construction debris or reprocessed wood products are not acceptable for use in erosion control mix. It contains a well-graded mix of particle sizes and may contain rocks up to 4 inches in diameter. Properly manufactured mix will have organic matter content between 80 and 100 percent (dry weight), 100 percent of particles must pass a 6-inch screen, the organic portion needs to be fibrous and elongated, it may contain only small proportions of silts, clays, or fine sand, and its pH should be between 5.0 and 8.0. Its applications include erosion control berms and mulch.
Erosion control plans: Written guidelines specific to a project or activity, describing various techniques and methods to control erosion for specific construction activities.
Fill: Any earth, rock, gravel, sand, silt, clay, peat, or debris that is put into or upon, supplied to, or allowed to enter a water body or wetland. Material, other than structures, placed in or adjacent to a water body or wetland.

Filter strip: Undisturbed areas of ground consisting of natural vegetation and natural litter such as leaves, brush, and branches, located between a water resource and access road, skid road or trail, or other area of disturbed soil.
Ford: A permanent crossing of a stream utilizing an area of existing, non-erodible substrate of the stream, such as ledge or cobble, or by placing non-erodible material such as stone or geotextile on the stream bottom.
Geotextile, Non-woven: Synthetic material made of spun polypropylene fiber used to support wetland fill or stabilize soils.
Geotextile, Woven: Synthetic material of woven polypropylene used to stabilize soils and make sediment barriers (silt fence).
Great pond: An inland water body which in a natural state has a surface area in excess of 10 acres, and any inland water body which is artificially formed or increased which has a surface area in excess of 30 acres.
Intermittent watercourse: Water course that has water in it only part of the year. It is still considered a natural resource.
Mats: Pre-constructed, portable, timber platforms used to support equipment or travel in or over wetlands or water bodies.
Mulch: Temporary erosion control such as hay, bark, or some similar natural material utilized to stabilize disturbed soil.
Perennial seed mix: Seed mixture made up of seeds from plants that persist for several years.
Perennial watercourse: A river, stream, or brook depicted as a solid blue line on the most recent edition of a United States Geological Survey 7.5 minute series topographic map. Typically has water in it year round.
Permanent access road: Project access road that is not restored after project construction completion. Permanent access roads should be designed and constructed so they are not an erosion problem.
Permanent stabilization: Establishment of a permanent vegetative cover on exposed soils where perennial vegetation is needed for long-term protection.
Permanent vegetative cover: Perennial seed stock, including but not limited to grasses and legumes that persist for more than several growing seasons.
Protected Natural Resource: Coastal sand dune system, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, community public water system primary protection areas, great ponds or rivers, streams, or brooks. (From the Maine Natural Resources Protection Act, 38 M.R.S.A. Section 480-B., revised 2007).
Riprap: Heavy, irregular-shaped rocks that are fit into place, usually without mortar, on a slope in order to stabilize and prevent soil erosion.
Sediment barrier: Staked hay bales, silt fence, or similar materials placed in a manner to intercept silt and sediment laden water runoff.
Sedimentation: Deposition of earthen material in a water body or wetland.
Sensitive Natural Resource: Area that deserves special attention because it is significant wildlife habitat, fisheries habitat, or has other natural resource values. These areas may require the use of minimum impact construction techniques such as use of mats, leaving vegetation intact for buffers, special timing of construction, or other specific techniques.
Settling basin (sediment/catch basin): Excavated pit placed to intercept water running off disturbed soils or dirt road bed. Usually used only where filter strip is inadequate to protect a stream, pond, or wetland from silt and sediment.

Silt fence: Woven geotextile sediment barrier. Proper installation requires placement on-contour and keying the fabric in at ground level.
Steep slopes: Slopes in excess of eight (8) percent.
Stone check dam: A small, temporary dam constructed across a swale or drainage ditch. The purpose is to reduce the velocity of concentrated flows, reducing erosion and trapping sediment generated in the ditch.
Stream: Generally, a channel between defined banks with a gravel, sand, rock, or clay base that flows at least part of the year. It may be a dry channel part of the year. The Maine Natural Resources Protection Act contains a more detailed definition.
Structure: Anything built for the support, shelter, or enclosure of persons, animals, goods, or property of any kind, together with anything constructed or erected with a fixed location on or in the ground. Examples of structures include buildings, utility lines, and roads.
Temporary access road: A road constructed solely for project access which is restored to original grade upon project completion, if not sooner. All areas disturbed by access road construction and use will be stabilized, including road ditches, travel ways, and slopes back to vegetated conditions. In most cases, any roadway ditches associated with temporary access roads should be refilled to reestablish pre-development drainage conditions.
Temporary stabilization: Mulch, matting, or seed, or a combination thereof, utilized to stabilize soil. Soil stockpiles left in place longer than 14 days must have temporary stabilization.
Temporary vegetative cover: An annual seed mixture, typically annual rye and oats.
Topography: The contour and elevation of the surface of the ground.
Turn out: Water diversion that directs water out of a ditch or off a travel-way and into a vegetated buffer.
Upland edge: The area of uplands alongside a wetland, stream, or water body.
Wastes requiring special handling: Wastes generated from construction activity including engine oil, hydraulic oil, gear oil, diesel, gasoline, or coolants.
Water bar: Constructed bar across an access road or skid trail that directs surface water off the road or trail into a stable vegetated surface or filter strip. They are used as a temporary measure on active roads or when closing roads permanently to prevent erosion.
Water body: River, stream, brook, pond, wetland, or tidal area.
Water resource: River, stream, brook, pond, wetland, or tidal area.
Wetland: An area that is inundated or saturated by surface or groundwater at a frequency and for a duration sufficient to support, and which under normal circumstance do support, a prevalence of wetland vegetation typically adapted for life in saturated soils. The Maine Natural Resources Protection Act contains a more detailed definition.

APPENDIX B

CONSTRUCTION MATERIALS SOURCE LIST

APPENDIX B

CONSTRUCTION MATERIALS SOURCE LIST

The following list of vendors has been selected given the wide variety of construction materials they offer. The list is not meant to be all-inclusive or an indication of favored vendors.

W.H. Shurtleff Company (Culverts, Geotextiles)

One Runway Road
Suite 8
South Portland, Maine 04106-6169
1-800-633-6149
www.whshurtleff.com

A. H. Harris (Geotextiles, i.e. Curlex Excelsior Blankets)

22 Leighton Road
Augusta, Maine 04332
(207) 622-0821
www.ahharris.com

585 Riverside Street
Portland, Maine 04103
(207) 775-5764

North American Green (Erosion control materials)

Maine Distributor:
E.J. Prescott
P.O. Box 600
32 Prescott Street, Libby Hill Business Park
Gardiner, Maine 04345
(207) 582-1851
www.ejprescott.com

New England Organics (Erosion Control Mulch)

135 Presumpscot Street, Unit 1
Portland, ME 04103
1-800-933-6474
www.newenglandorganics.com

APPENDIX C

OTHER RECOMMENDED REFERENCE MANUALS

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OTHER RECOMMENDED REFERENCE MANUALS

Maine Erosion and Sediment Control Best Management Practices (BMPs). Manual for Designers and Engineers. Bureau of Land Resources, Maine Department of Environmental Protection, Augusta, Maine. October 2016. http://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf

Maine Erosion and Sediment Control Practices Field Guide for Contractors. Bureau of Land Resources, Maine Department of Environmental Protection, Augusta, Maine. 2014. http://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf

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Forest Transportation Systems: Roads and Structures Manual. Seven Islands Land Company, Bangor, Maine. Third Edition, 1999.

APPENDIX D

CONSTRUCTION TECHNIQUE ILLUSTRATIONS

CULVERT CROSSING

IMPROPER INSTALLATION

- **Culvert is undersized, allowing overflow to cross travel-way**
- **Insufficient cover thickness over culvert**
- **Outlet is not stable, leading to erosion**
- **Culvert outlet is set too high causing it to be impassable to fish and other aquatic organisms**

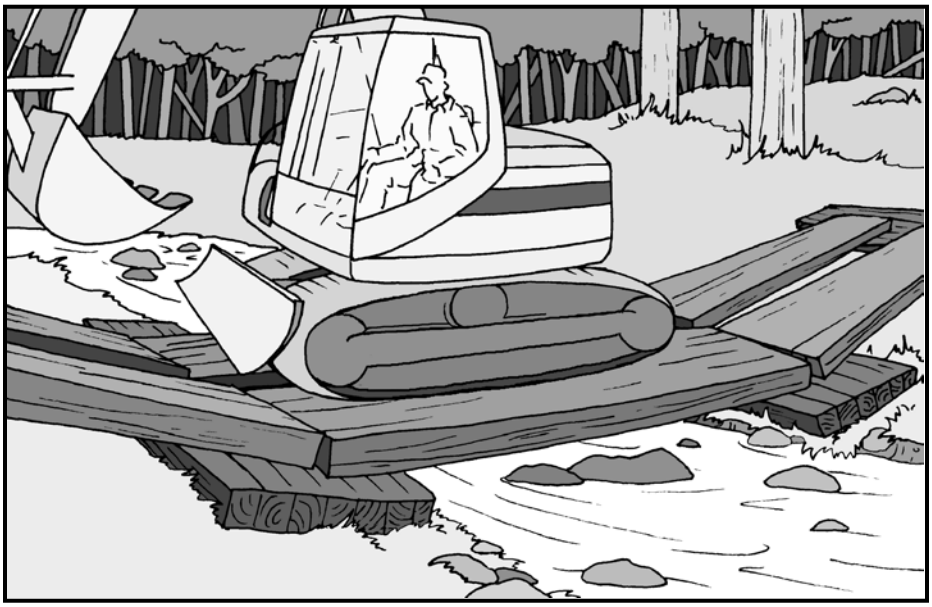
PROPER INSTALLATION

- **Culvert is adequately sized for flow**
- **Sufficient cover thickness over culvert**
- **Inlet and outlet are adequately supported by gravel and rock to protect and maintain stability**
- **Outlet is properly seated at or below stream bottom allowing aquatic organisms to access upstream**

CRANE MATS – WATERBODY CROSSING

IMPROPER INSTALLATION

- **Mats not long enough to keep equipment out of water and wetland soils**
- **Lacks cross supports which elevate travel mat**
- **Mats do not extend far enough to protect wetland soils from rutting**



PROPER INSTALLATION

- **Mats are elevated by cross-supports on stream banks, keeping them up out of water and out of wet soils**
- **Water flows under mats**
- **Mats extend over approaches to crossing protecting soils from rutting and eroding**
- **Equipment stays out of water and wetlands**

CRANE MATS – WETLAND CROSSING

IMPROPER INSTALLATION

- **Long axis of mats is not perpendicular to travel direction**
- **Mats are working down into wetland causing significant disturbance and picking up mud**
- **Mats do not extend beyond wetland edge to solid ground**

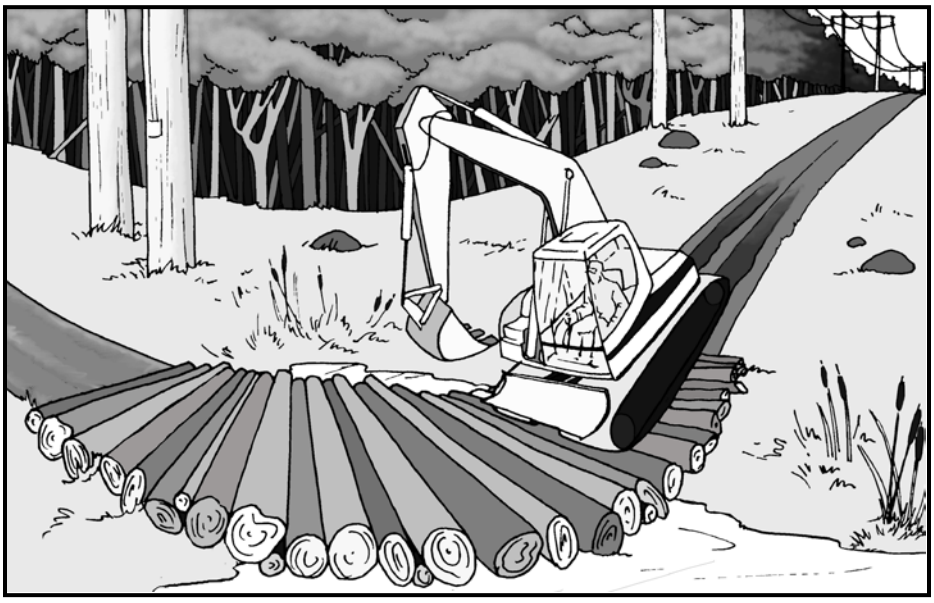
PROPER INSTALLATION

- **Correct orientation relative to travel direction**
- **Entire wetland is spanned, preventing rutting at ends of crossing**

CORDUROY CROSSING

IMPROPER INSTALLATION

- **Insufficient corduroy to support equipment**
- **Corduroy is sunken into wetland soil**
- **Approaches are steep, rutted, and are not protected with additional corduroy or slash**
- **Flow is interrupted, and water is soiled with mud and silt**



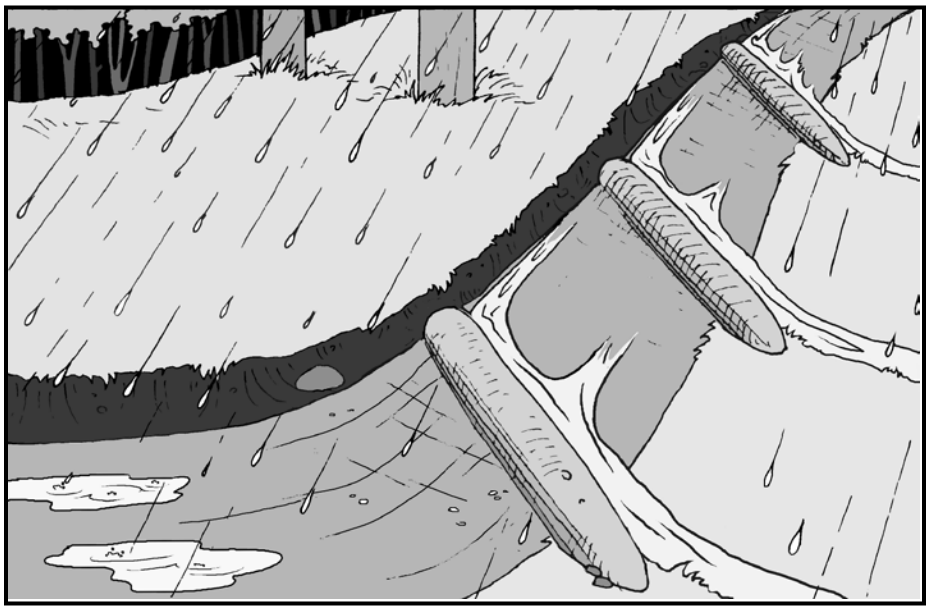
PROPER INSTALLATION

- **Adequate amount of layered corduroy to protect soil from rutting**
- **Approaches are protected from rutting by extension of corduroy beyond edges of crossing**
- **Flow is maintained and water is clear of mud and silt**

WATER BARS

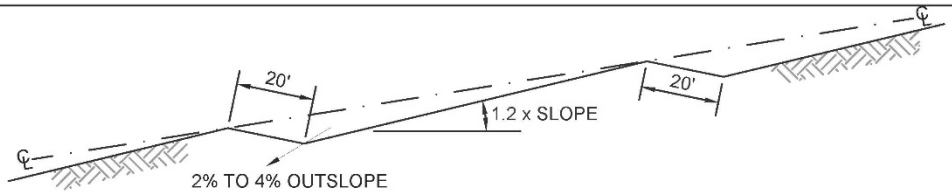
IMPROPER INSTALLATION

- **Flow directed to uphill side on upper bar**
- **Angle of lower bar is too shallow**
- **Lower bar does not extend far enough, allowing water to escape around ends**
- **Bars are not high enough, allowing water to flow over top, eroding them**

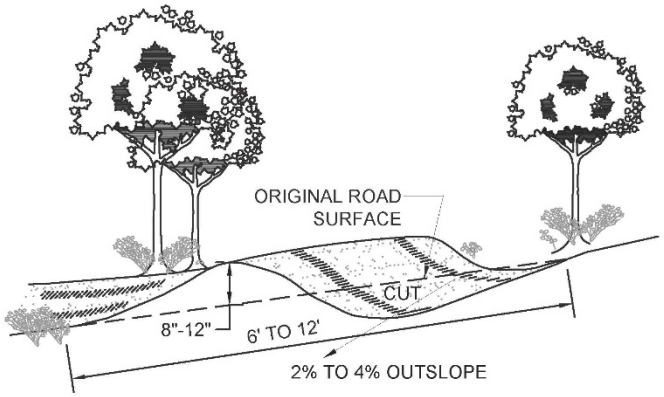


PROPER INSTALLATION

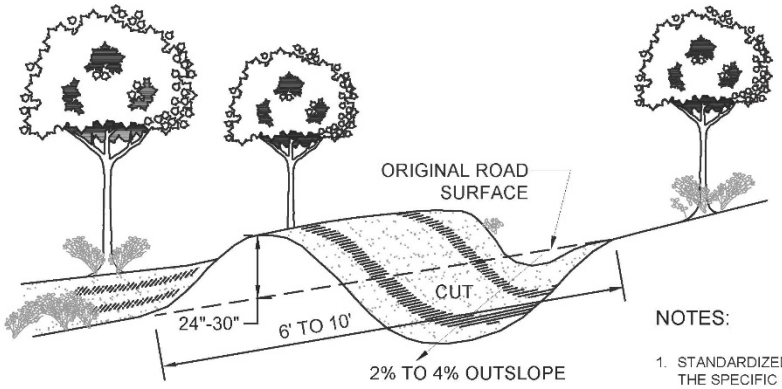
- **Bars are at moderate angles**
- **There are enough bars to divert all water flowing down road**
- **Bars are high enough to prevent water from flowing over them**
- **Bars extend beyond edges of road, preventing water from flowing around them**



BROAD BASE DIPS ON ROAD



SHALLOW WATER BAR



DEEP WATER BAR

NOTES:

1. STANDARDIZED DESIGNS MUST BE ADAPTED TO THE SPECIFIC SITE.
2. CONSTRUCT WATER BAR IN ACCORDANCE WITH MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS, LATEST EDITION.

SCALE: N.T.S.

CENTRAL MAINE POWER

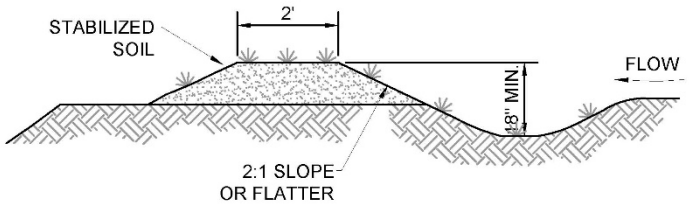
CENTRAL MAINE POWER COMPANY

TYPICAL WATER BAR DETAIL

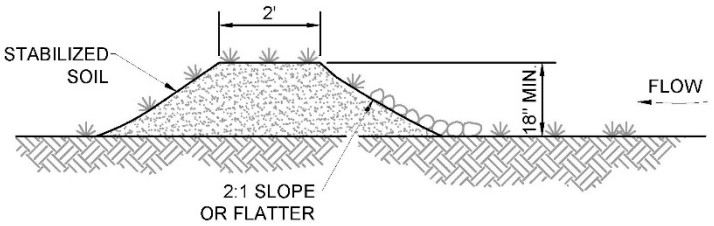
UPGRADIENT RUNOFF DIVERSION

NOTES:

1. ANGLE DIVERSION AWAY FROM SLOPE, WITH A 2-3% DOWNWARD GRADIENT.
2. DIVERSION SHALL DISCHARGE DIRECTLY TO EITHER A PLUNGE POOL, LEVEL SPREADER OR OTHER ENERGY DISSIPATER.
3. STABILIZE WITH MATERIAL THAT IS APPROPRIATE FOR THE SLOPE AND EXPECTED RUNOFF (EROSION CONTROL BLANKETS, GRAVEL OR RIPRAP).
4. CONSTRUCT DIVERSION IN ACCORDANCE WITH MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS, LATEST EDITION.



DIVERSION WITH EXCAVATION
SCALE: N.T.S.



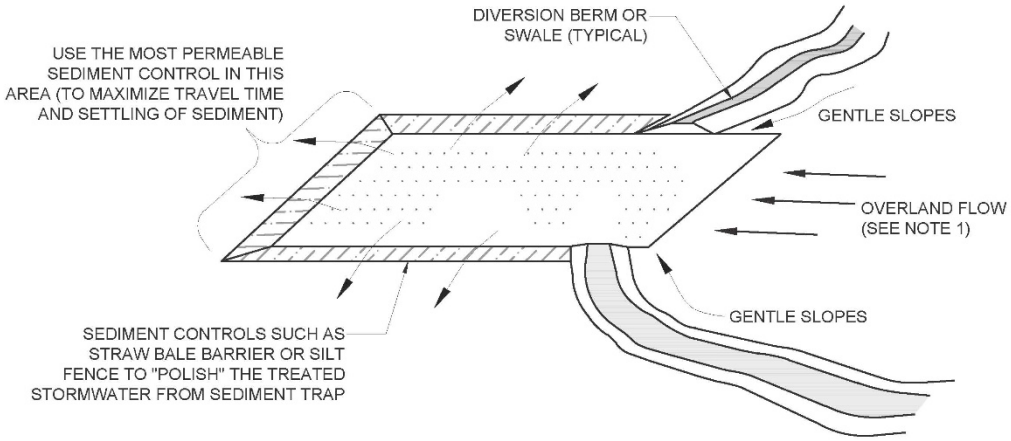
DIVERSION WITH FILL
SCALE: N.T.S.

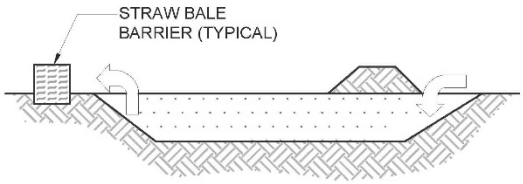
CENTRAL MAINE POWER

CENTRAL MAINE POWER COMPANY

TYPICAL UPGRADIENT RUNOFF DIVERSION DETAIL

TEMPORARY SEDIMENT TRAP





NOTES:

1. MAXIMUM AREA FOR OVERFLOW SEDIMENT TRAP IS USUALLY 1 ACRE. MUST HAVE GENTLE SLOPES (LESS THAN 2% GENERALLY) AND PREDOMINATELY OVERLAND SHEET FLOW.
2. MAXIMUM PERMANENT WET DEPTH IS 2 FEET. OVERFLOW SEDIMENT TRAPS MAY NOT BE EFFECTIVE FOR HIGH GROUNDWATER TABLE AND INFLOWS.
3. CONSTRUCT SEDIMENT TRAP IN ACCORDANCE WITH MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS, LATEST EDITION.

SCALE: N.T.S.

CENTRAL MAINE POWER

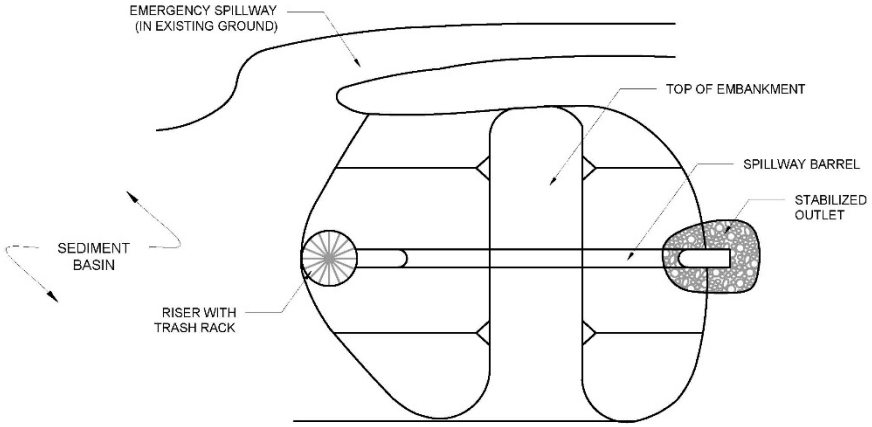
CENTRAL MAINE POWER COMPANY

TYPICAL SEDIMENT TRAP DETAIL

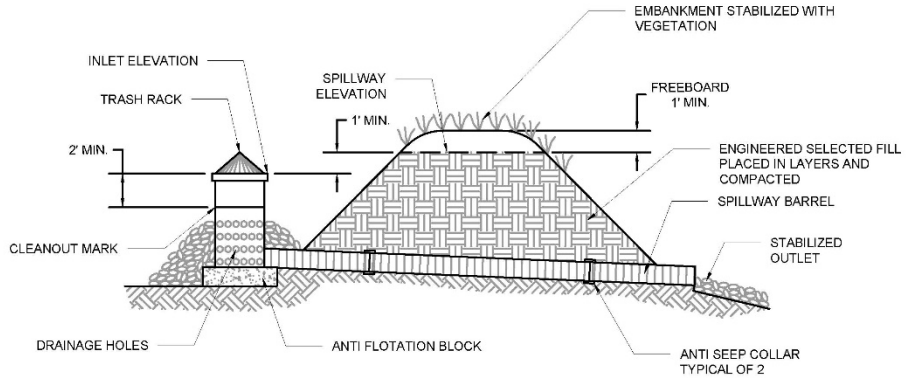
TEMPORARY SEDIMENT BASIN

NOTES:

1. THE BASIN'S LENGTH TO WIDTH RATIO SHALL BE 2:1 OR FLATTER.
2. BASIN SHALL BE LOCATED MORE THAN 100 FEET AWAY FROM ANY MAPPED OR DELINEATED NATURAL RESOURCE AND SHALL NOT DIRECTLY DISCHARGE TO A STREAM.
3. STABILIZE BASIN WITHIN 7 CALENDAR DAYS WITH RIPRAP, EROSION CONTROL MIX OR AN ANCHORED EROSION CONTROL BLANKET.
4. CONSTRUCT BASIN IN ACCORDANCE WITH MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS, LATEST EDITION.



PLAN
SCALE: N.T.S.



SECTION
SCALE: N.T.S.

CENTRAL MAINE POWER COMPANY

TYPICAL SEDIMENT BASIN DETAIL

SEDIMENT BARRIER – HAY BALES

PROPER INSTALLATION

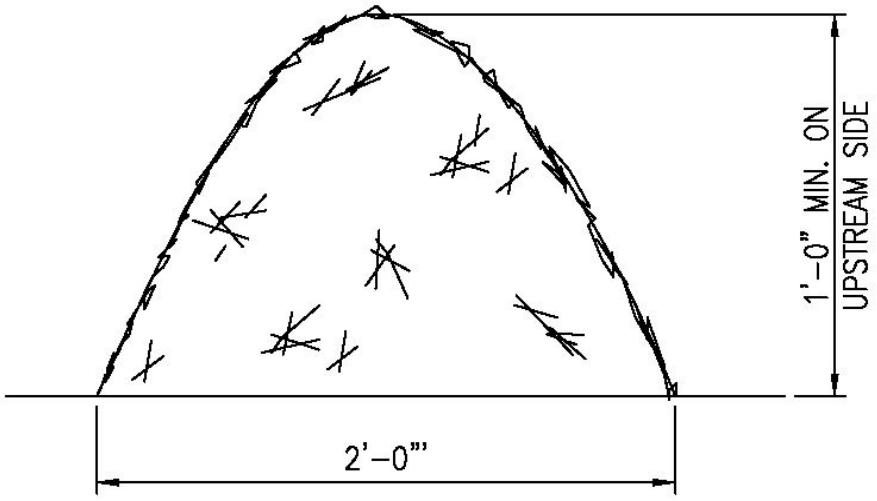
- **Dug trench to key bales into ground**
- **Stakes placed and driven in at angles to snug bales together**
- **Excess dirt used to cover openings and cracks**

SEDIMENT BARRIER – SILT FENCE

PROPER INSTALLATION

- **Dug trench to key material into ground**
- **Stakes are placed facing away from disturbed area**
- **Excess material on bottom is buried with excess dirt to prevent water from flowing under fence**

EROSION CONTROL MIX BERM DETAIL



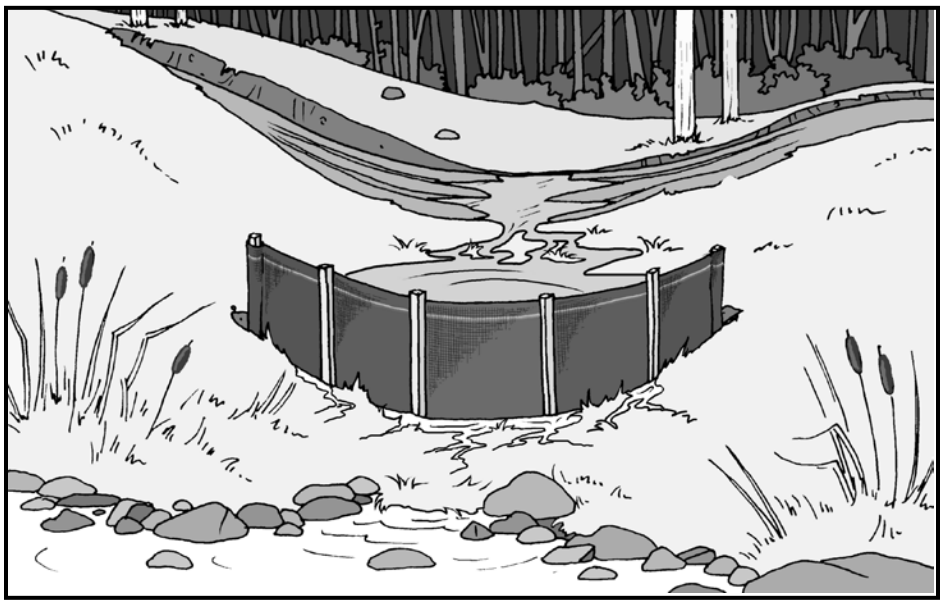
- Use erosion control mix berm in place of silt fence and/or hay bale sediment barriers
- Erosion control soil/bark mix shall consist of: shredded bark, stump grindings, composted bark or flume grit and fragmented wood generated from water-flume log handling systems. The mix shall conform to the following:

1. pH: 5.0 to 8.0
2. Screen Size: 6" – 100% passing
   ¾" – 70% to 85% passing
   Mix shall not contain large portions of silts, clays or fine sands
3. Organic material: 20% - 100% (dry weight basis)
   Organic portion must be fibrous and elongated
4. Soluble salts shall be <4.0 mmhos/cm

SEDIMENT BARRIER – SILT FENCE

IMPROPER INSTALLATION

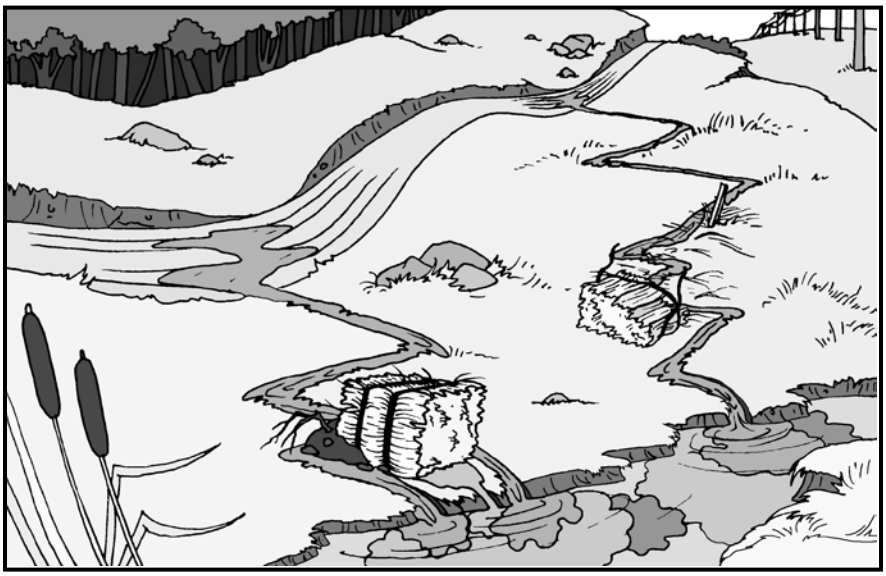
- **Fence located too far from road and too close to resource**
- **Stakes installed on wrong side of fence**
- **Needs maintenance (restaking, restapling, or even replacement)**
- **Placed in concentrated flow**



PROPER INSTALLATION

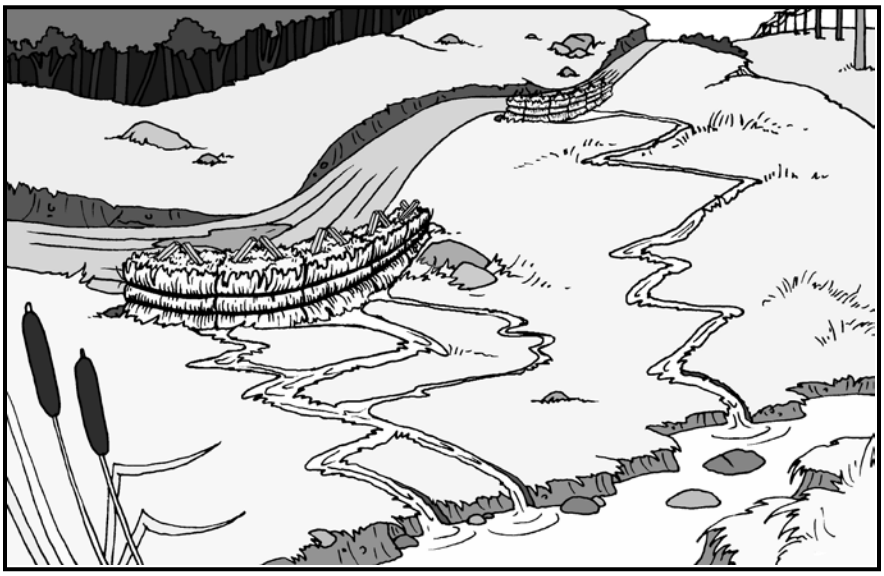
- **Adequate distance from road and resource allows road to capture and slow water, and allows silt fence to filter it before reaching resource**
- **Stakes placed on correct side; facing resource, while filter fabric faces disturbed area**
- **Adequate length; fence is long enough and turned uphill at ends to prevent water from escaping around edges**

SEDIMENT BARRIER – HAY BALES



IMPROPER INSTALLATION

- **Placed in concentrated flow**
- **Hay bales are not staked**
- **Not enough hay bales to adequately capture and slow flow**
- **Too far from source of runoff and sediment**
- **Improper orientation of bales; horizontal grass fibers do not provide adequate filtration, and strings on ground rot and bales to fall apart**



PROPER INSTALLATION

- **Staked properly; bales are secure and snug to one another**
- **Sufficient number of bales to slow flow and insure that no water escapes around edges**
- **Positioned close to disturbance, and far from resource to allow proper filtration**
- **Vertical orientation of grass fibers provides adequate filtration**
- **Placed along contour to capture sheet flow**

APPENDIX E

EROSION AND SEDIMENTATION CONTROL LAW* 38 M.R.S.A. § 420-C

APPENDIX E

EROSION AND SEDIMENTATION CONTROL LAW*

38 M.R.S.A. § 420-C

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in section 480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken and the site must be maintained to prevent unreasonable erosion and sedimentation.

This section applies to a project or any portion of a project located within and organized area of this State. This section does not apply to agriculture fields. Forest management activities, including associated road construction or maintenance, conducted in accordance with applicable standards of the Maine Land Use Regulation Commission, are deemed to comply with this section. This section may not be construed to limit a municipality's authority under home rule to adopt ordinances containing stricter standards than those contained in this section.

* The Erosion and Sedimentation Control Law is administered by the Maine Department of Environmental Protection (MDEP), Augusta, Maine. Please contact the MDEP with specific questions regarding this law.

APPENDIX F

MAINE SLASH LAW* 12 M.R.S.A. § 9333

APPENDIX F

MAINE SLASH LAW*

12 M.R.S.A § 9333

§9333. Disposal along railroad and utility lines

*1. **Stumpage owner**. A stumpage owner, operator, landowner or agent who cuts or causes or permits to be cut any forest growth on lands that are within or border the right-of-way of a railroad, a pipeline, or an electric power, telegraph, telephone or cable line may not place slash or allow it to remain on the ground within the right-of-way or within 25 feet of the nearer side of the right-of-way.*

*2. **Construction**. Slash accumulated by the construction and maintenance of a railroad, a highway, a pipeline or electric power, telegraph, telephone or cable line may not be left on the ground but must be hauled away, burned or chipped. Slash may not be left or place within the right-of-way or within 25 feet of the nearer side of the right-of-way. If a burning permit is denied or revoked under this chapter, the director may allow logs that are too large to be chipped to remain in the right-of-way until the director determines that their removal is economically feasible.*

*3. **Utility line maintenance**. Slash accumulated by the periodic maintenance of a pipeline or an electric power, telegraph, telephone or cable line may be disposed of in the following manner.*

- *A. Slash with a diameter of 3 inches or less may be left in piles on the ground within the maintained portion of the right-of-way. A pile may not be higher than 18 inches from the ground or longer than 50 feet and must be separated from other piles by a minimum of 25 feet in every direction. A buffer strip with a minimum width of 10% of the total width of the maintained right-of-way must be kept totally free of slash with a diameter of 3 inches or less.*
- *B. Slash with a diameter of more than 3 inches must be removed, chipped or limbed and placed on the ground surface. The pieces must be separated and may not be piled one piece over another. Slash of this size may be left within the maintained buffer strips.*
- *C. If a utility line right-of-way is adjacent to a road, slash that is 3 inches or less in diameter must be removed, burned or chipped. Slash with a diameter of more than 3 inches may be left on the ground within the right-of-way and must not be limbed and separated and may not be piled one piece over another. Usable timber products generated from the maintenance of a utility right-of-way may be piled within the right-of-way but must be removed within 30 days.*

* Note that this is an excerpt from the full text of the law. Please contact the Maine Forest Service, Augusta, Maine, for the full text of the law or with specific questions regarding the Slash Law.

APPENDIX G

CULVERT SIZES FOR STREAM CROSSINGS

(3X RULE)

CULVERT SIZES (ROUND) FOR STREAM CROSSINGS (3x RULE)

AVERAGE STREAM WIDTH

Take two measurements across the stream from bank to bank where you intend to place the culvert. Measurements should be taken at the normal high water line (NHWL). To find the NHWL during low flow periods look for water stains on rocks or a debris line along the bank. Add the first measurement to the second and divide this number by 2. This equals the average stream width.
Example: 36in. + 47 in. = 83in. 83÷2 = avg. stream width of 41.5 inches. (Round up to 42in.)

AVERAGE STREAM DEPTH

Take 3 measurements from the bottom of the stream to the NHWL.
Add the measurements together and divide this number by 3. This equals the avg. stream depth.
Example: 12in. + 16in. + 14in. = 42in. 42÷3 = average stream depth of 14 inches.

USING THE TABLE

Take the average width and depth figures and determine where they intersect on the table above.
*For example, for an average stream width of 42 inches (on the left side of the table), and an average stream depth of 14 inches (along the top of the table), the intersect shows a culvert diameter of 48 inches.

Average Stream Width		Average Stream Depth (Inches)														
Feet	Inches	2	4	6	8	10	12	**14***	16	18	20	22	24	26	28	30
1	12	12	15	18	21	21	24	30	30	30	30	36	36	36	36	42
1.5	18	12	18	21	24	30	30	36	36	36	42	42	42	42	48	48
2	24	15	21	24	30	30	36	36	42	42	48	48	48	54	54	54
2.5	30	15	21	30	30	36	42	42	48	48	48	54	54	60	60	60
3	36	18	24	30	36	42	42	48	48	54	54	60	60	60	66	66
3.5	**42***	18	30	36	36	42	48	**48**	54	54	60	60	66	66	72	72
4	48	21	30	36	42	48	48	54	54	60	66	66	66	72	72	78
4.5	54	21	30	36	42	48	54	54	60	66	66	72	72	78	78	84
5	60	21	30	42	48	48	54	60	66	66	72	72	78	78	84	84
5.5	66	24	36	42	48	54	60	60	66	72	72	78	78	84	84	90
6	72	24	36	42	48	54	60	66	66	72	78	78	84	90	90	96
6.0	78	24	36	42	54	60	60	66	72	78	78	84	90	90	96	96
7	84	30	36	48	54	60	66	72	72	78	84	84	90	96	96	102
7.5	90	30	42	48	54	60	66	72	78	84	84	90	96	96	102	102
8	96	30	42	48	54	66	66	72	78	84	90	90	96	102	102	108
8.5	102	30	42	48	60	66	72	78	84	84	90	96	102	102	108	108
9	108	30	42	54	60	66	72	78	84	90	96	96	102	108	108	114
9.5	114	30	42	54	60	66	72	78	84	90	96	102	102	108	114	114
10	120	30	48	54	66	72	78	84	90	96	96	102	108	114	114	120
10.5	126	36	48	54	66	72	78	84	90	96	102	108	108	114	120	120
11	132	36	48	60	66	72	78	84	90	96	102	108	114	114	120	126
11.5	138	36	48	60	66	78	84	90	96	102	108	108	114	120	126	126
12	144	36	48	60	66	78	84	90	96	102	108	114	120	120	126	132
12.5	150	36	48	60	72	78	84	90	96	102	108	114	120	126	132	132
13	156	36	54	60	72	78	90	96	102	108	114	114	120	126	132	138
13.5	162	36	54	66	72	84	90	96	102	108	114	120	126	132	132	138
14	168	36	54	66	72	84	90	96	102	108	114	120	126	132	138	144
14.5	174	36	54	66	78	84	90	96	108	114	120	126	126	132	138	144
15	180	42	54	66	78	84	96	102	108	114	120	126	132	138	144	144

EXHIBIT C: NEW ENGLAND CLEAN ENERGY CONNECT PLAN FOR PROTECTION OF SENSITIVE NATURAL RESOURCES DURING INITIAL VEGETATION CLEARING

New England Clean Energy Connect
Plan for Protection of Sensitive Natural Resources
During Initial Vegetation Clearing

Prepared by:

Central Maine Power Company
83 Edison Drive
Augusta, Maine 04336

Revised June 2020

CENTRAL MAINE POWER

Introduction

This construction Vegetation Clearing Plan (VCP) applies to construction of the new transmission lines associated with Central Maine Power Company's (CMP) New England Clean Energy Connect (NECEC) project. The VCP describes restrictive and protective management practices required for work within and adjacent to protected natural resources during vegetation clearing associated with NECEC project construction. The requirements described in this VCP apply to initial project construction and are not intended to apply to planned or emergency maintenance or repair actions.

The goal of the VCP is to provide construction personnel with a cohesive set of vegetation management specifications and performance standards for work within and adjacent to protected natural resources during transmission line construction.

The protected natural resources subject to restrictive vegetation management requirements include:

- Wetlands and streams (intermittent and perennial);
- Perennial streams within Segment 1 (greenfield) portion of the NECEC project;
- All streams within the Gulf of Maine Distinct Population Segment (GOM DPS), which includes the critical habitat;
- Outstanding river segments, rivers, streams or brooks containing threatened or endangered species (e.g., Atlantic salmon);
- Gold Brook and Mountain Brook containing State Threatened Roaring Brook Mayfly (*Epeorus frisoni*) and / or State Special Concern Northern Spring Salamander (*Gyrinophilus porphyriticus*) species;
- State Special Concern Species Habitat: Rusty Blackbird (*Euphagus carolinus*) and Wood Turtle (*Glyptemys insculpta*);
- Significant Vernal Pools (SVP);
- Inland Waterfowl and Wading Bird Habitat (IWWH);
- Deer Wintering Areas (DWA);
- Potential maternal roosting areas for Northern Long-eared Bat (*Myotis septentrionalis*);
- Rare plant locations;
- Locations over mapped significant sand and gravel aquifers, and:
- Viewpoints from Coburn Mountain and Rock Pond.

In locations where individual restrictions or procedures overlap, or multiple restrictions apply, the more stringent restrictions and all applicable procedures will be followed by construction personnel.

1.0 Right-of-Way Vegetation Management Procedures

1.1 Arboricultural Management Practices

Capable vegetation will be removed and controlled within the footprint of the NECEC development, including within the new (greenfield) and co-located transmission line corridors. Capable vegetation is defined as woody plant species and individual specimens that are capable of growing to a height that would reach the conductor safety zone, as illustrated in Figure 1 attached to this exhibit. Removal of capable species beneath the conductors within transmission line corridors is intended to meet the following goals:

- Facilitate construction;
- Maintain the integrity and functionality of the line;
- Facilitate safe operation of the line;
- Maintain access in case of emergency repairs; and
- Facilitate safety inspections.

Therefore, the objective of this VCP will be to remove woody vegetation capable of encroaching into the conductor safety zone of the new transmission lines to facilitate construction and maintain the integrity and safe operation of the transmission line consistent with the standards of North American Electric Reliability Corporation's (NERC) Transmission Vegetation Management[1]. This will be accomplished by practicing an integrated vegetation management strategy using a combination of mechanical cutting, hand-cutting, and herbicide applications[2]. Mechanical mowing may also be used along access roads or in unusual circumstances, should the typical procedures not suffice.

Throughout clearing and construction, shrub and herbaceous vegetation will remain in place to the extent practicable. Capable vegetation, dead trees, "hazard trees" and all vegetation over 10 feet in height will be removed during initial transmission line corridor clearing prior to construction of the new transmission lines. Due to the sag of the electric transmission lines between the structures, which varies with topography, the distance between structures, tension on the wire, electrical load, air temperature and other variables, the required clearance is typically

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

[2] No herbicide will be applied in the Segment 1 corridor, within 100 feet of the one observed small whorled pogonia occurrence in the Town of Greene, or within 100 feet of the 174-acre Casavant tracts on the east and west sides of the transmission line corridor in this vicinity in Greene.

achieved by removing all capable species from the transmission line corridor. Hazard trees are those trees typically on the edge of the transmission line corridor that pose an imminent threat of violating the minimum separation standard or are at risk of contacting the transmission lines themselves due to disease, configuration or potential instability. Hazard trees are typically removed immediately upon identification.

The following procedures will be implemented during vegetation management activities to protect sensitive natural resources:

a. Protected natural resources and their associated buffers will be flagged or located with a Global Positioning System (GPS) prior to all construction and clearing activities;

b. When and if terrain conditions permit (e.g., certain ravines and narrow valleys) capable vegetation will be permitted to grow within and adjacent to protected natural resources or critical habitats where maximum growing height can be expected to remain well below the conductor safety zone. Narrow valleys are those that are spanned by a single section of transmission line, structure-to-structure.

c. Hand cutting with chainsaws will be the preferred method of vegetation clearing within protected natural resource buffers and sensitive areas, where reasonable and practicable and with the appropriate protective measures. However, mechanized equipment may be used during frozen conditions, or when matted travel lanes and the reach-in technique are implemented;

d. Equipment access through wetlands or over streams will be avoided as much as practicable by utilizing existing public or private access roads, with landowner approval where required;

e. Equipment access in upland areas with saturated soils will be minimized to the extent practicable, or these areas will be matted to avoid excessive rutting or other unnecessary ground disturbance;

f. Significant damage to wetland or stream bank vegetation, if any, will be repaired following completion of clearing activities in the area;

g. Areas of significant soil disturbance will be stabilized and reseeded following completion of clearing activities in the area.

h. When capable vegetation within and adjacent to a protected natural resource or identified critical habitat will be removed for the purpose of constructing the development, the natural regeneration of non-capable woody vegetation will be allowed within all protected resources. At a minimum, the natural regeneration of non-capable woody vegetation will be allowed. To facilitate the regeneration of natural vegetation within and adjacent to (generally, within 75 feet of) protected natural resources and special habitats, the contractor will separate the topsoil from the mineral soil when excavating during project construction. The excavated

topsoil will be returned to its original place and position in the landscape and appropriate erosion control methods will be utilized.

i. Locations within the NECEC that contain any of the invasive plant species listed in Table 1 below, will be identified prior to the start of construction of the project or the start of construction on any individual segment of the project at the discretion of CMP or its contractor. CMP will develop an invasive species vegetation monitoring plan and submit it to the Department for review and approval prior to the start of construction on the project. This plan will have a stated objective of preventing the introduction and spread of invasive species as a result of construction. Herbicide application is an acceptable method of controlling invasive growth when hand removal or other non-chemical methods will not be effective, including in protected natural resources and other sensitive areas.

Table 1 – Invasive Plant Species[1]

Species	Common Name
1. Alliara petiolata	Garlic mustard
2. Berberis thunbergii	Japanese barberry
3. Celastrus orbiculatus	Oriental bittersweet
4. Cynanchum louiseae	Black swallowwort
5. Elaeagnus umbellata	Autumn olive
6. Fallopia japonica	Japanese knotweed
7. Frangula alnus	Glossy buckthorn
8. Impatiens glandulifera	Ornamental jewelweed
9. Lonicera morrowii	Morrow's honeysuckle
10. Lonicera tatarica	Tatarian honeysuckle
11. Lythrum salicaria	Purple loosestrife
12. Phragmites australis	Common reed
13. Poa nemoralis	Wood blue grass
14. Rhamnus cathartica	Common buckthorn
15. Rosa multiflora	Multiflora rose

1-MNAP's list of "Currently considered invasive in Maine" excluding aquatic plant species.

2.0 Vegetation Management – Segment 1 Specific

This section describes the four (4) types of vegetation management required along the Segment 1 corridor, which achieve:

- Full canopy height vegetation;
- Vegetation with a 35-foot minimum height;
- Deer travel corridors; and/or
- Tapered vegetation.

This section also describes riparian filter areas adjacent to rivers, streams, and brooks.

2.1 Full Canopy Height Vegetation

Full canopy height vegetation is required in three locations along the Segment 1 corridor. The locations, identified more specifically below in Table 2-1, include the Gold Brook crossing (which is within Wildlife Area 4), the Mountain Brook crossing (Wildlife Area 6), and the Upper Kennebec River crossing (Wildlife Area 11).

In areas where full canopy height vegetation must be maintained, vegetation will be removed only in areas necessary to access pole locations and install the poles. (There are no pole locations in Wildlife Area 11.) This includes the area within the entire width of the 150-foot wide corridor. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line.

2.2 35-Foot Minimum Vegetation Height

In areas where minimum 35-foot tall vegetation must be maintained, only areas necessary to access pole locations or install and maintain poles will be cleared during construction. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line. In other areas within the entire width of the corridor only trees taller than 35 feet, or trees that may grow taller than 35 feet prior to the next scheduled maintenance, will be removed during construction. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and may not exceed a three-year cycle within any particular area within this segment without prior approval from the Maine Department of Environmental Protection (MDEP).

With regard to ongoing vegetation management, trees that exceed 35 feet or are anticipated to exceed this height before the next scheduled maintenance cycle will be cut at ground level and will only be removed if leaving them in place would violate the Maine Slash Law or create a fire or safety hazard.

2.3 Deer Travel Corridors

Eight deer travel corridors must be managed as softwood stands to promote deer movement across the transmission line corridor during the winter months when snow depths have the potential to inhibit deer travel. These travel corridors are located on each side of the four structures identified in Table 2-1 and will extend along the corridor, under the conductors, where conductor height allows for taller vegetation within the corridor. These deer travel corridors must

be designated and labeled corridors 1 through 8, and managed as softwood stands and allow for the maximum tree height that can practically be maintained without encroaching into the conductor safety zone (approximately 24 feet of clearance between the lowest conductor at maximum sag conditions and the top of vegetation) or into the necessary cleared area adjacent to each structure. Tree heights will vary based on structure height, conductor sag, and topography, but must generally range from 25 to 35 feet.

Within designated deer travel corridors 1 through 8, during the initial vegetation clearing for construction all capable hardwood species will be cut and individual softwood specimens will be cut to heights necessary so that they do not intrude into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance. On an ongoing basis, softwood specimens that are not intruding into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance will be retained. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line.

Table 2-1

Area Name	From Structure	To Structure	Location	Min. Veg Height	Notes	Approximate Length (miles)
Wildlife Area 1	3006-800	3006-799	Beattie Twp	35'	Includes Number One Brook not visible from Beattie Pond	0.22
Wildlife Area 2	3006-771	3006-765	Skinner Twp	35'	Includes crossing of the South Branch of the Moose River (all of TNC 2)	1.19
Wildlife Area 3	3006-758	3006-752	Skinner Twp Appleton Twp	35'	Includes five perennial streams and four intermittent streams	1.25
Wildlife Area 4	3006-742	3006-731	Appleton Twp	35' (except full canopy height at Gold Brook crossing)	Includes Gold Brook crossing (structures 3006-735 to 3006-732) and Roaring Brook Mayfly habitat adjacent to that crossing where full canopy height vegetation is required, as well as group of 5 unnamed streams; portions adjacent to Leuthold Preserve	2.18
Wildlife Area 5	3006-708	3006-683	Hobbstown Twp T7 BKP WKR Bradstreet Twp	35'	Includes area near Moose Pond and surrounding land owned by BPL, Whipple Brook crossing, areas adjacent to Leuthold Preserve, and unnamed stream crossing where topography may allow crossing without taller poles (structures 3006-708 to 3006-707)	4.87
Wildlife Area 6	3006-635	3006-633	Johnson Mtn Twp	Full canopy height	Mountain Brook crossing, includes Roaring Brook Mayfly habitat	0.38
Wildlife Area 7	3006-598	3006-597	Johnson Mtn Twp	35'	Cold Stream crossing; adjacent to Cold Stream Forest Tract	0.23
Wildlife Area 8	3006-589	3006-588	Johnson Mtn Twp	35'	Unnamed stream crossing where 35-foot vegetation likely can be maintained without taller poles	0.2
Wildlife Area 9	3006-576	3006-563	West Forks	35'	Includes Tomhegan Stream crossing and adjacent to Cold Stream Forest Tract	2.21

Area Name	From Structure	To Structure	Location	Min. Veg Height	Notes	Approximate Length (miles)
Wildlife Area 10	3006-542	3006-541	Moxie Gore	35'	Moxie Stream crossing where 35-foot vegetation likely can be maintained without taller poles	0.19
Wildlife Area 11	Eastern edge of clearing for the HDD Termination Station in West Forks	Western edge of clearing for the HDD Termination Station in Moxie Gore	West Forks Moxie Gore	Full canopy height	Upper Kennebec River crossing; deer travel corridors 9 and 10	0.56
Wildlife Area 12						
	3006-548		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 7 and 8	0.23
	3006-543		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 5 and 6	0.18
	3006-542		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 3 and 4	0.09
	3006-541		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 1 and 2	0.1

Total distance along the Segment 1 corridor with taller vegetation is approximately 14.08 miles.

2.4 Tapered Vegetation

Tapered vegetation is required along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors is required. In Wildlife Area 12 taller vegetation is required for deer travel corridors 1 through 8. Within this wildlife area, tapering is required along the transmission line corridor in the sections outside the deer travel corridors. For example, the section of the transmission line corridor between structures 3006-542 and 3006-543 that is not within a deer travel corridor must be tapered.

"Tapering" refers to a form of vegetation management along the transmission line corridor where increasingly taller vegetation is allowed to grow as the distance from the wire zone increases (see Figure 2 of this Exhibit.).

Along Segment 1 where tapering is required, the transmission line includes two conductors running parallel to each other and separated by 24 feet. A shield wire runs over each conductor. The wire zone is the 54-foot wide area that runs along the center of the 150-foot wide corridor and includes the 24-foot wide area below and between the two conductors, plus 15 feet on each side of the set of conductors (15 ft. + 24 ft. + 15 ft. = 54 ft.).

In a tapered corridor, within this 54-foot wide wire zone all woody vegetation will be cut to ground level during construction. During maintenance of this portion of the corridor only non-capable species are allowed to grow (capable species includes woody species and specimens capable of growing tall enough to reach into the conductor safety zone). Within a tapered corridor, the result is that within the 54-foot wide wire zone vegetation that is approximately 10 feet tall regenerates so that the wire zone primarily consists of native, scrub-shrub habitat with non-capable species. (Without tapering, the corridor would be cleared and maintained as scrub-shrub habitat across the entire 150-foot width.)

In a tapered corridor, the area outside the wire zone will be selectively cut during construction to create a taper with vegetation approximately 15 feet tall near the wire zone and increasing to approximately 35 feet tall near the edge of the 150-foot wide corridor. The first taper includes the areas within 16 feet of each side of the wire zone, within which vegetation 15 feet tall and under, including capable species, will be maintained. The second taper includes the next 16 feet on each side of the corridor, within which taller vegetation up to 25 feet tall will be maintained. The third and final taper includes the next 16 feet on each side of the corridor, within which taller vegetation up to 35 feet tall will be maintained.

As vegetation is maintained within a tapered corridor, any trees that exceed the designated height for the taper they are within, or are anticipated to exceed the height before the next scheduled maintenance cycle, will be cut at ground level. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and may not exceed a three-year cycle within any particular area within this segment without prior approval from the Department. Any trees that are cut will only be removed if leaving them in place would violate the Maine Slash Law or create a fire or safety hazard.

The overall result is that a cross section of a 150-foot wide tapered corridor breaks down into the following components:

16’ 3rd taper + 16’ 2nd taper + 16’ 1st taper + 54’ wire zone + 16’ 1st taper + 16’ 2nd taper + 16’ 3rd taper = 150’ wide corridor. The approximate maximum vegetation height of each taper is:

- 1st taper: 15-feet
- 2nd taper: 25-feet
- 3rd taper: 35-feet

Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line. Soil disturbance and grading will be minimized through careful planning of temporary access ways. When the temporary access ways are removed, the disturbed areas will be restored to their pre-construction grade and allowed to revegetate. Except for the areas immediately around the base of each transmission line structure, the full width and length of the transmission corridor will remain vegetated following construction of the Project.

2.5 Riparian Filter Areas

Unless more restrictive requirements apply[3], within 100 feet of all perennial streams in Segment 1, all coldwater fisheries streams as identified in Waterbody Crossing Table, all streams containing threatened or endangered species, and all Outstanding River Segments; and within 75 feet of all other streams, a riparian filter area will be maintained. Riparian filter areas will be established and maintained in the following manner:

[3] More restrictive requirements include, but are not limited to, requirements to maintain taller vegetation within the corridor such as provided for in Section 2, Table 2-1.

- The boundary of each riparian filter area will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot filter area prior to clearing. Flagging will be maintained throughout construction.
- Foliar herbicides will be prohibited within the riparian filter area[4], and all refueling/maintenance of equipment will be excluded from the filter area unless it occurs on an existing paved road or if secondary containment is used with oversight from an environmental inspector.
- All stream crossings by heavy equipment will be performed through the installation of equipment spans with no in-stream disturbances. Streams will not be forded by heavy equipment.
- Initial tree clearing will be performed during frozen ground conditions whenever practicable, and 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 riparian filter area.
- Within that portion of the appropriate riparian filter area that is within the wire zone (i.e., within 15 feet, horizontally, of any conductor), all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut back to ground level and resulting slash will be managed in accordance with Maine's Slash Law. No other vegetation, other than dead or hazard trees, will be removed. Within the riparian filter area and outside of the wire zone, non-capable species may be allowed to exceed 10 feet in height unless it is determined that they may encroach into the conductor safety zone prior to the next maintenance cycle. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and must not exceed a three-year cycle within any particular area within this segment without prior approval from the Department. Vegetation maintenance within other segments will be on an approximately four-year cycle.
- Removal of capable species, dead or hazard trees within the appropriate riparian filter area will typically be accomplished by hand-cutting. Use of mechanized harvesting equipment is allowed if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent practicable; within the wire zone, all woody vegetation may be cut to ground level.
- Any construction access roads that must cross streams or brooks must be designed, constructed, and maintained to minimize erosion and sedimentation.

[4] Additionally, no herbicide will be used in the Segment 1 corridor and adjacent to the small whorled pogonia occurrence in the Town of Greene.

3.0 Vegetation Management Methods – All Transmission Line Corridor Areas

3.1 Mechanical Methods

During construction, vegetative clearing of capable species will be completed primarily with mechanical equipment, including motorized equipment. All capable species and any dead or hazard trees will be cut at ground level except in designated buffer zones, as described below. Large vegetation cut during construction will be handled in accordance with the Maine Slash Law[5]. Any wood that is chipped and spread on the corridor shall be left in layers no more than two inches thick, as measured above the mineral soil surface.

As a conservation effort to protect the Northern Long-eared Bat, CMP will suspend tree clearing activities during the maternity roost season of June 1 to July 31. Additionally, initial clearing activities will be performed during frozen ground conditions, to the extent practicable, and, 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.

Access roads and travel lanes will be located to protect sensitive and protected natural resources to the maximum extent practicable and construction matting will be used in accordance with CMP's environmental guidelines and per the timber mat performance standards provided below.

Timber mats or matting used for construction:

- shall not be made from wood from ash trees (Fraxinus sp);
- shall be constructed of unfinished timbers free of bark, unless produced by a firm certified by the Maine Forest Service (MFS) for production of mats with incidental bark for this project. Such mats must be marked as outlined in the supplier's agreement. Applicant shall maintain a copy of the MFS compliance agreement including a representation of the accepted mark in the records;
- shall be cleaned of soil and vegetative material by pressure washing before entering the State of Maine;
- shall not have been used in, or made from lumber from, Federally Quarantined areas as set out in 7 CFR 301 unless accompanied by the appropriate USDA certificate of treatment required for interstate transport. Said certificates will be maintained in a central filing location available for review by appropriate Agency personnel for a period of three (3) years after project completion, as determined by CMP; and
- must have shipping information sufficient to identify the shipper and number

5 12 MRS §§ 9331 et seq.

and shipping origin of the mats.

The Maine Forest Service and U. S. Department of Agriculture reserve the right to inspect all timber mats and matting material used for the project for compliance with these standards.

3.2 Herbicide Application

Herbicide applications will likely begin after clearing is completed to gain control of vegetation growth (with the exception of areas listed below where no herbicides will be applied). When control is achieved, treatment will typically occur as part of scheduled maintenance on a 4-year cycle or as needed. By using herbicides, desired vegetation along the transmission line corridor will eventually consist of a dense, low-growing plant community that will discourage the establishment of capable tree species. Therefore, fewer capable woody species and specimens will require treatment in future applications.

The following procedures and restrictions will be implemented during herbicide applications:

a. No herbicides or pesticides will be used in Segment 1 (new corridor) of the Project.

b. No herbicides will be used within the full width and length of the transmission line corridor adjacent to the 174-acre parcel near Allen Pond in Greene, i.e., the portion of the corridor containing transmission line structures 3006-24 to 3006-29.1.

c. Herbicides will be used in strict accordance with the manufacturer's EPA-approved labeling and will not be applied directly to waterbodies or areas where surface water is present;

d. In the co-located sections outside the GOM DPS, no foliar herbicides will be applied within 75 feet of rivers, streams, brooks, lakes, ponds, or within 25 feet of wetlands that have water present at the surface at the time of the application.

e. For stream and rivers classified as outstanding river segments, as well as those containing threatened or endangered species (e.g., Atlantic salmon) and coldwater fisheries, and all streams within the GOM DPS which includes the critical habitat, no foliar herbicides will be applied within a 100-foot buffer. This requirement extends to all streams, regardless of classification, located immediately west of Moxie Pond.

f. Herbicides will not be applied to stumps (cut stump treatment) within areas of standing water.

g. Herbicides will not be mixed, transferred or stored within 100 feet of any wetland or surface water. On public access roads, herbicide mixing, transfer or storage may be done within 100 feet of wetlands or surface waters;

h. Herbicides will not be mixed, transferred or stored within 100 feet of Significant Vernal Pool depressions. On public access roads, herbicide mixing, transfer or storage may be done within 100 feet of Significant Vernal Pool depressions;

i. Unless performed on public access roads, herbicides will not be mixed, transferred or stored over mapped significant sand and gravel aquifers;

j. Herbicides will not be applied, mixed, transferred or stored within 100 feet of any known private well or spring or within 200 feet of any known public water supply well. On public access roads, herbicide mixing, transfer or storage may be done within 200 feet of known public water supply wells;

k. When herbicide applications are performed in wetlands without standing water, only herbicides approved for use in wetland environments will be used;

l. Herbicides will not be applied to any area when it is raining or when wind speed exceeds 15 miles per hour as measured on-site at the time of application. When wind speeds are below 3 miles per hour, applicators should be aware whether a temperature inversion is present, and should consult the herbicide label to determine whether application should proceed under these conditions;

m. The foreman or licensed applicator on each herbicide application crew will be licensed by the Maine BPC and will remain in eye contact and within earshot of all persons on his/her crew applying herbicides. At least one individual from any company applying herbicides will also hold a Commercial Master Applicator License issued by the BPC. This Master Applicator must have the ability to be on-site to assist persons applying herbicides within six hours driving time. If an out-of-state company is conducting the herbicide application, the company will have a Master Applicator in Maine during any application. Application of herbicides will be in accordance with applicable regulations promulgated under the Maine Pesticides Control Act, including those regulations to minimize drift, to maintain setbacks from sensitive areas during application, and to maintain setbacks from surface waters during the storing/mixing/loading of herbicides; and

n. Herbicides will typically be mixed in a truck-mounted tank that remains on public access roads. Herbicide application is done by personnel with low-volume, hand-pressurized (manual) backpacks with appropriate nozzles, to minimize drift, who travel along the transmission line corridor by foot or by all-terrain vehicle and spot-treat target species and specimens.

The location of all streams, wetlands, significant vernal pools, rare plant locations, known wells, and mapped significant sand and gravel aquifers crossed by the transmission line corridor will be provided to construction personnel.

3.3 Petroleum Product & Hazardous Materials Management

Any petroleum products or other hazardous material within the transmission line corridor during construction will be managed in accordance with CMP's Environmental Control Requirements for

Contractors and Subcontractors – Oil and Hazardous Material Contingency Plan (see Exhibit 15-1 of the NECEC Site Law Application) and will include the following setbacks unless CMP can demonstrate that, due to special circumstances at specified locations, these setbacks are impractical at those locations.

(a) No fuel storage, vehicle/equipment parking and maintenance, and refueling activity may occur within 100 feet of a protected wetland or other waterbody, unless no practicable alternative exists and secondary containment with 110% capacity is provided for any fuel storage containers or tanks, or if it occurs on a paved road.

(b) No fuel storage, vehicle/equipment parking and maintenance, and refueling activity may occur within 200 feet of a known private water supply.

(c) No fuel storage, vehicle/equipment parking and maintenance, and refueling activity may occur within 400 feet of a known public water supply.

(d) No fuel storage, vehicle/equipment parking and maintenance and refueling activity may occur within 25 feet minimum of the following:

(i) An area listed in Maine's biological conservation data system, Biotics, of the Maine Natural Areas Program, including rare natural communities and ecosystems (state rarity rank of S1 through S3 and habitats supporting Endangered or Threatened plant species). Boundaries and locations are as determined by the Maine Natural Areas Program of the Department of Agriculture, Conservation and Forestry.

(ii) Habitat of any species declared rare, threatened or endangered by the Maine Department of Inland Fisheries and Wildlife, Maine Department of Marine Resources, or the Director of the U.S. Fish and Wildlife Service.

4.0 Vegetation Management within Freshwater Wetlands

Transmission line corridor wetlands range in type from small, emergent wetlands formed in ruts from logging equipment to large forested wetland systems.

4.1 Vegetation Clearing Restrictions within and Adjacent to Freshwater Wetlands

The following restrictions apply to vegetation clearing within freshwater wetlands and their buffers:

a. Unless frozen, heavy equipment travel in wetlands will be performed on construction matting, or other approved alternative protective measures will be implemented.

b. If initial clearing or other construction activities result in areas of bare soil or minimally vegetated cover, the areas of bare soil will be allowed to revegetate naturally, where practicable. If areas are sufficiently large to warrant planting, a native seed designed to provide short term cover will be applied, and the area will be allowed to return to non-capable native woody and perennial herbaceous vegetation naturally.

c. No accumulation of slash will be left within wetlands.

5.0 Vegetation Clearing within Stream Buffers (Riparian Filter Areas)

Stream buffers, as measured horizontally from the top of each stream bank, will be established for vegetation removal along streams within the transmission line corridor. A "stream buffer" is a buffer on a stream, river, or brook. In no case may the stream buffer be reduced to less than 75 feet. Additional restrictions will be applied within 100 feet of streams meeting certain criteria, as described in 4.1, below.

This section describes the restrictions related to vegetation removal within these stream buffers. All vegetation clearing procedures and restrictions that apply to vegetation management for transmission line corridor construction also apply within the stream buffers.

5.1 Additional Vegetation Clearing Restrictions within Stream Buffers

The following additional restrictions apply to vegetation clearing within stream buffers:

a. Riparian natural buffers (or "stream" buffers) will be retained within 100 feet of all streams in the GOM DPS which includes the critical habitat, all perennial and coldwater fishery streams within Segment 1 (new corridor portion) of the Project, outstanding river segments, or rivers, streams, or brooks containing Threatened or Endangered species (e.g., Atlantic salmon) unless the Department determines that the functions and values of the stream buffer will not be impacted by the removal of vegetation and approves an alternative minimum buffer.

b. In the area adjacent to Moxie Pond in Segment 2, CMP will construct and maintain the project with a 100-foot riparian filter area identical to the riparian filter areas adjacent to coldwater fishery streams in Segment 1.

c. For streams in areas where the new transmission line will be co-located within existing rights-of-way, CMP proposes to maintain a 75 foot buffer, unless meeting any of the above criteria, since the corridor is currently being maintained in an early successional state according to the guidelines set forth in CMP's Vegetation Management Plan (Exhibit D), and the effect of the additional clearing (typically less than 75 feet) to accommodate the new line has been minimized.

d. The boundary of each stream buffer will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot stream buffer prior to clearing. Flagging will be maintained throughout construction.

e. Foliar herbicides will be prohibited within the stream 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.

f. All stream crossings by heavy equipment will be performed through the installation of equipment spans with no in-stream disturbances. Streams will not be forded by heavy equipment.

g. Initial tree clearing will be performed during frozen ground conditions whenever practicable, and 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. CMP will not place any transmission line structures within the stream buffer, unless specifically authorized by the MDEP and accompanied by a site-specific erosion control plan. No structures will be placed within 25 feet of any stream regardless of its classification.

h. Within that portion of the appropriate stream buffer that is within the wire zone (i.e., within 15 feet, horizontally, of any conductor; see Figure 1), all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut back to ground level and resulting slash will be managed in accordance with Maine's Slash Law. No other vegetation, other than dead or hazard trees, will be removed. Within the stream buffer and outside of the wire zone, non-capable species may be allowed to exceed 10 feet in height unless it is determined that they may encroach into the conductor safety zone prior to the next four year maintenance cycle (See specifics for Segment 1 in Section 2 of this plan);

i. Removal of capable species, dead or hazard trees within the appropriate stream buffer will typically be accomplished by hand-cutting. Use of mechanized harvesting equipment is allowed if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent practicable;

j. No slash will be left within 50 feet of any stream.

Allowing non-capable vegetation to remain as described above within the appropriate stream buffer will provide shading and reduce the warming effect of direct sunlight (insolation). Low ground cover vegetation will also remain to filter any sediment in surface runoff. These restrictions will allow the stream buffers to provide functions and values similar to those provided prior to transmission line construction.

5.2 Vegetation Management within the Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas of Mountain Brook and Gold Brook

During consultation with Maine Department of Inland Fisheries and Wildlife (MDIFW) for the NECEC project, MDIFW identified Gold Brook (PSTR 15-06, PSTR 16-07, PSTR 16-10 and PSTR 16-15) and Mountain Brook (PSTR-33-01, PSTR-EM-34-01, PSTR-EM-34-01) as high priority resources in which full height vegetation should be retained within the 250-foot conservation management areas to protect the habitat of Roaring Brook Mayfly and Northern Spring Salamander. Gold Brook in Appleton Twp contains Roaring Brook Mayfly habitat, while Mountain Brook in Johnson Mountain Twp contains both Roaring Brook Mayfly and Northern Spring Salamander habitat.

During construction, vegetation will be cleared only in areas required for access and construction of the NECEC project; all other areas will be retained as full height vegetation, as shown on Figure 3 and Figure 4 of this exhibit. The access roads and structure preparation areas will be maintained as scrub-shrub habitat to allow for post-construction maintenance, repair and/or emergency access during operation of the line.

6.0 Vegetation Clearing within Significant Vernal Pool Habitat (SVPH)

Vegetated buffers of 250 feet, as measured from the edge of the pool depression, will be established for SVPs crossed by the transmission line corridor. The SVP depression and buffer area together comprise the SVPH. Vegetation clearing within the SVPH will be subject to the same procedures and prohibitions, as applicable, which are required in the typical transmission line corridor, as well as to the additional measures below.

6.1 Additional Vegetation Management Restrictions within SVPH

The following additional restrictions apply to vegetation clearing within SVPH:

a. Mechanized equipment will not be allowed within the vernal pool depression, unless the depression encompasses the entire width of the transmission line corridor. Mechanized equipment will only be allowed to cross the vernal pool depressions during frozen or dry conditions or with the use of mats;

b. Initial clearing within a SVPH will occur during frozen ground conditions. If not practicable, hand cutting or reach in techniques will be used. If that is not adequate, travel lanes to accommodate mechanical equipment in the 250-foot buffer may be used with approval of the MDEP.

c. Between April 1 and June 30 in any calendar year, no vegetation removal using tracked or wheeled equipment will be performed within the 250-foot SVPH ;

d. No refueling or maintenance of equipment, including chainsaws, will occur within 250 feet of SVP depressions, unless done so on a public access road;

e. No herbicide use is permitted within 25 feet of the SVP pool depression; and

f. No accumulation of slash will be left within 50 feet of the edge of the SVP depression and slash piles will not exceed 18 inches tall.

7.0 Vegetation Clearing within Moderate or High Value Inland Waterfowl and Wading Bird Habitat

Inland Waterfowl and Wading Bird Habitats (IWWH) are habitats mapped by the MDIFW that contain an inland wetland complex used by waterfowl and wading birds, plus a 250-foot nesting habitat area surrounding the wetland. The nesting habitat is considered to be part of the mapped IWWH. No additional buffers are proposed for IWWHs beyond this mapped habitat, and as such the vegetation maintenance restrictions apply to the mapped habitat only.

A survey for Great Blue Heron colonies within or immediately adjacent to existing IWWH will be conducted by CMP between April 20 and May 31, and prior to initial transmission line clearing; if any colonies are identified, CMP will consult with MDIFW and obtain approval from the MDEP prior to construction in the vicinity of any colony.

Vegetation clearing within the IWWH will be subject to the same procedures and prohibitions, as applicable, which are required in the typical transmission line corridor and for stream buffers.

7.1 Additional Vegetation Clearing Restrictions within Inland Waterfowl and Wading Bird Habitat

The following additional restrictions apply to vegetation clearing within mapped IWWH:

a. If practicable, vegetation clearing will take place during frozen ground conditions. If not practicable, vegetation within IWWH will be removed using hand cutting or reach-in techniques and appropriate techniques to minimize disturbance to the maximum extent practicable, such as the use of travel lanes to accommodate mechanical equipment use in the IWWH.

b. Between April 15 and July 15, use of motorized vehicles (e.g., all-terrain vehicles) and mechanized equipment (e.g., chainsaws or brush cutters) within IWWH is prohibited. Use of non-mechanized hand tools is allowed during this time period;

c. No refueling or maintenance of equipment, including chainsaws, will occur within the IWWH, unless done so on a public access road; and

d. No herbicide use is permitted within 25 feet of any wetland within the mapped IWWH.

e. Where overhead transmission lines cross an IWWH area, CMP will install bird diverters or aviation marker balls according to the manufacturer's guidelines and applicable transmission line codes unless otherwise determined to be impracticable by the Maine Department of Environmental Protection (MDEP) in consultation with MDIFW.

f. Provided they do not present a safety hazard and are naturally present, CMP will leave undisturbed a minimum of 2-3 snags per acre to provide nesting habitat for waterfowl. Where appropriate, to mitigate habitat impacts due to the development, and as approved by the MDEP, capable species will be topped, girdled, and/or treated with herbicides (except in areas where herbicides are prohibited per this Plan) to prevent re-growth to create snags. Snags will be 12-16 inch in diameter or the largest size available from the existing stand of vegetation.

g. No accumulation of slash will be left within the IWWH.

h. Impacts to scrub-shrub and herbaceous vegetation within the IWWH will be minimized to the maximum extent practicable.

8.0 Vegetation Clearing within Mapped Deer Wintering Areas

Deer Wintering Areas (DWA) provide important refuge for white-tailed deer (*Odocoileus virginianus*) during the winter months in northern climates and are typically characterized by an extensive stand of mature softwood species with a dense forest canopy.

During construction, impacts to scrub-shrub and herbaceous vegetation and other non-capable species will be minimized to the maximum extent practicable. No additional vegetation clearing restrictions are proposed within mapped DWAs in the co-located portions of the Project, as all capable species will be removed from these and other areas within the transmission line corridor in order to comply with NERC Transmission Vegetation Management standards. Clearing restrictions within the Upper Kennebec DWA are provided below.

8.1 Additional Clearing Restrictions within the Upper Kennebec Deer Wintering Area

In consultation with MDIFW for the NECEC Project, CMP has identified and designated ten deer travel corridors within the Upper Kennebec River DWA (Map ID 060065), as shown in Figure 5 of this exhibit, which will be managed as softwood stands to promote deer movement across the transmission line corridor during the winter months when snow depths have the potential to inhibit deer travel. The NECEC transmission line corridor traverses this DWA from a point in The West Forks Plantation to a point in Moxie Gore. CMP has agreed to manage these deer travel corridors, designated and labeled Corridors 1 through 8 in Figure 5, as softwood stands and will allow for the maximum tree height that can practically be maintained without encroaching into the conductor safety zone or into the necessary cleared area adjacent to structures. Tree heights will vary based on structure height, conductor sag, and topography, but will generally range from 25 to 35 feet. Vegetation within Corridors 9 and 10, which are located where the transmission line will be buried using horizontal directional drilling, will be allowed to grow to its full height.

Within designated deer travel corridors 1 through 8, during the initial vegetation clearing for construction all capable hardwood species and individual softwood specimens will be cut to

heights necessary so that they do not intrude into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance. Softwood specimens that are not intruding into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance will be retained. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair and/or emergency access during operation of the line. The designated deer travel corridors will be flagged prior to construction and identified in a database maintained by CMP, further described in Section 11.0.

9.0 Vegetation Clearing within State-mapped Rusty Blackbird Habitat

In consultation with MDIFW for the NECEC Project, CMP agreed to allow for the retention of 10-15-foot tall spruce/fir vegetation within the Rusty Blackbird habitat, shown in Figure 6. The additional height will avoid project impacts to habitat of this State Species of Special Concern. Additionally, tapered vegetation as described in Section 2.4 above, is required in this habitat.

Clearing activity is prohibited in this habitat between April 20 and May 31. During the initial vegetation clearing for construction activities, all capable hardwood species and softwood specimens over 15 feet in height, as well as those anticipated to grow taller than 15 feet in height prior to the next scheduled vegetation maintenance, will be cut at ground level and removed. Spruce/fir vegetation 10-15 feet in height will be retained. The access roads and structure preparation areas within the Rusty Blackbird habitat will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair and/or emergency access during operation of the line. The habitat will be flagged prior to construction and identified in a database maintained by CMP, further described in Section 11.0.

10.0 Wood Turtle Habitat

Clearing activity is prohibited in mapped wood turtle habitat between April 16 and October 14.

11.0 Vegetation Clearing within Rare Plant Locations

Vegetation clearing of the transmission line corridor has the potential to impact rare plants and/or alter their habitat. The following additional vegetative clearing restrictions will minimize impacts to rare plants. The additional restrictions will apply only to the demarcated locations of the identified rare plants. No additional buffers will be established surrounding rare plant locations. These restrictions are intended to maintain existing hydrology and limit soil disturbance within rare plant locations.

11.1 Additional Vegetation Clearing Restrictions within Rare Plant Locations

The following additional restrictions will apply to vegetation clearing for rare plant species in the identified location:

a. Unless rare plant locations encompass the entire width of the transmission line corridor, mechanized equipment will only be allowed to cross rare plant locations during frozen conditions, on established travel paths/crossings, or with the use of mats.

b. Initial clearing within rare plant communities will be undertaken during frozen ground conditions whenever practicable, and if not practicable selective mat placement and reach-in techniques will be used to minimize disturbance to the rare plant communities to the maximum extent practicable.

c. If initial clearing or other construction activities result in areas of bare soil or minimally vegetated cover, where practicable, these areas will be allowed to revegetate naturally. If areas are sufficiently large to warrant planting, a native seed mix designed to provide short term cover will be applied and the area will be allowed to return to native woody and perennial herbaceous vegetation naturally.

d. Heavy equipment travel within rare plant communities will be minimized to the maximum extent practicable. Hand cutting or "reach-in" techniques to cut and remove capable tree species and vegetation over 10 feet tall within the wire zone, or other techniques as agreed upon in consultation with the MDEP and Maine Natural Areas Program (MNAP), will be used. When equipment access is necessary, activity will be restricted to a few narrow travel lanes that have been clearly marked prior to clearing activity.

e. No refueling or maintenance of equipment, including chain saws, will occur within demarcated rare plant locations, unless done on a public access road.

f. No foliar herbicide use is permitted within the demarcated rare plant locations, however cut surface herbicides may be used on capable species and specimens.

g. No herbicides will be used within the full width and length of the transmission line corridor adjacent to the 174-acre parcel near Allen Pond in Greene, i.e., the portion of the corridor containing transmission line structures 3006-24 to 3006-29.1.

12.0 Vegetation Clearing Procedures over Mapped Significant Sand and Gravel Aquifers

Transmission lines located over mapped significant sand and gravel aquifers are subject to the typical transmission line corridor clearing procedures, except that no refueling or maintenance of equipment, and no herbicides may be mixed, transferred or stored, over the mapped significant sand and gravel aquifers, unless done so on a public access road.

13.0 Vegetation Clearing Procedures in Tapered Vegetation Management Areas

In consultation with MDEP and the LUPC, CMP determined that management of vegetation in a tapered configuration and manner was appropriate in order to minimize the visual impact from viewpoints on the summit of Coburn Mountain in Upper Enchanted Township and from Rock Pond looking towards Three Slide Mountain in T5 R6 BKP WKR. These areas include the following coordinates:

Coburn Mountain – From: 45°25'45.01"N, 70° 6'8.22"W To: 45°27'37.45"N, 70° 6'51.44"W

Rock Pond – From: 45°27'48.24"N, 70°25'31.82"W To: 45°27'54.92"N, 70°26'3.11"W

During initial clearing of the Project in these areas, CMP will retain capable vegetation outside of the wire zone up to 15 feet tall to facilitate future tapering that will allow capable vegetation up to 35 feet tall in areas outside of the wire zone.

14.0 Locating and Marking Buffers and Habitats

A database will be maintained, including maps and GIS shapefiles, of the buffers, restricted habitats, and sensitive areas and their locations relative to the nearest structure (pole) or road location. The distance and direction from the nearest structure to the sensitive area will be included with the name of the area and the structure number. All structures along the transmission line corridor will be numbered at the time of construction.

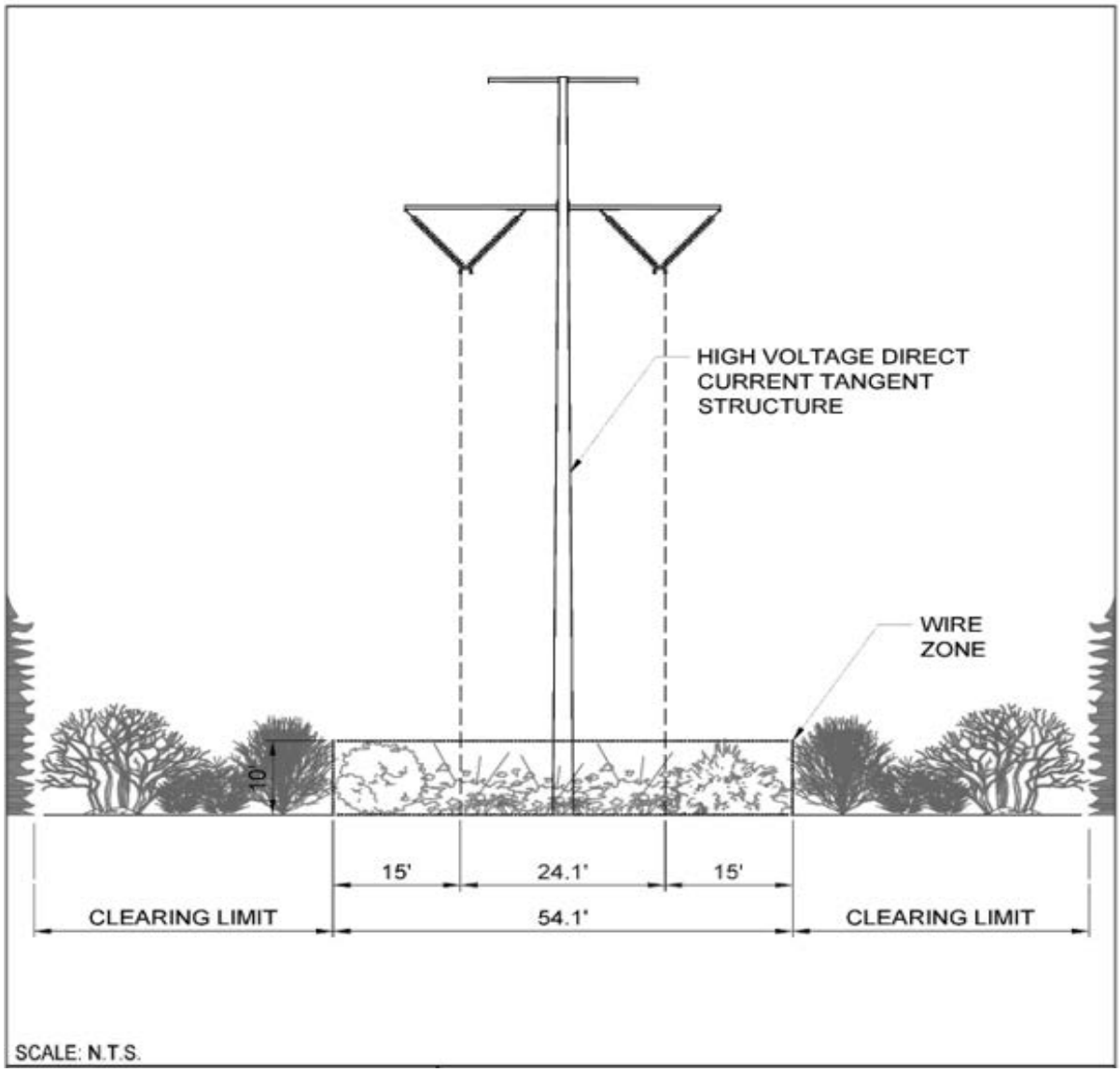
To aid in identifying restricted areas, buffers and restricted habitats will be located and demarcated in the field using brightly colored flagging or signage prior to the initiation of clearing and construction activities along the transmission line corridor. Alternatively, use of GIS data and GPS equipment may be used to provide accurate location of resources and associated buffers. If desired, personnel may permanently demarcate restricted habitats to aid in construction activities. Personnel working on the transmission line corridor will be provided a copy of this VCP. Use of the VCP in conjunction with the natural resource maps and Plan & Profile drawings will enable construction contractors to locate and mark restricted areas in the field.

15.0 Personnel Training

Personnel who will conduct vegetation clearing on the transmission line corridor will receive appropriate environmental training before being allowed access to the transmission line corridor. Construction and clearing personnel will be required to review this VCP prior to the training and before conducting any clearing or construction activities. The level of training will be dependent on the duties of the personnel. The training will be given prior to the start of clearing or construction activities. Replacement or new clearing or construction personnel that did not receive the initial training will receive similar training prior to performing any activities on the transmission line corridor.

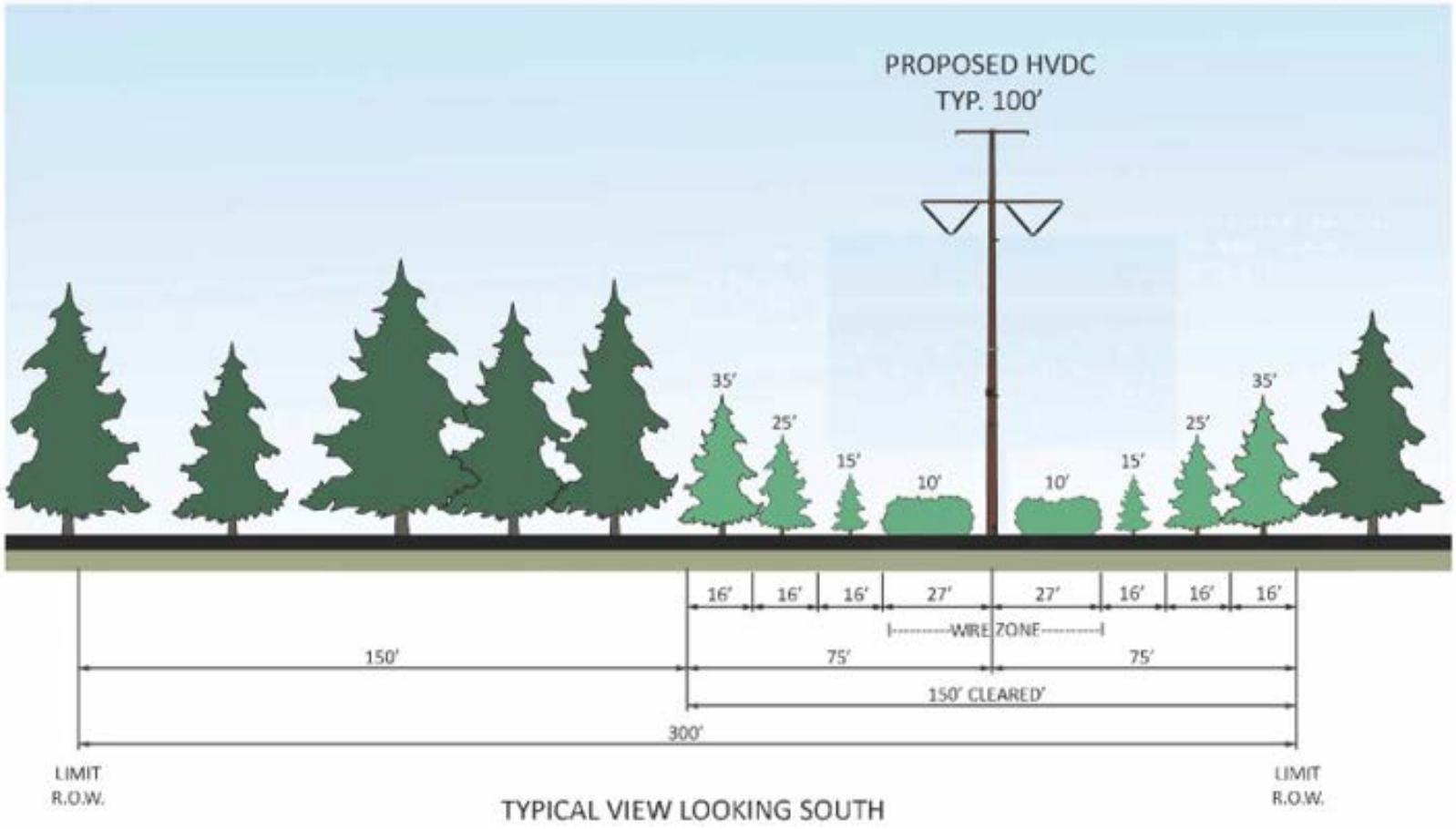
The training session will consist of a review of the buffers and restricted habitats, the respective vegetation clearing requirements and restrictions for each, and a review of how these areas and resources can be located in the field. Training will include familiarization with and use of GIS information and sensitive natural resource identification in conjunction with the contents of this VCP, as well as basic causes, preventive and remedial measures for contamination, and erosion and sedimentation of water resources.

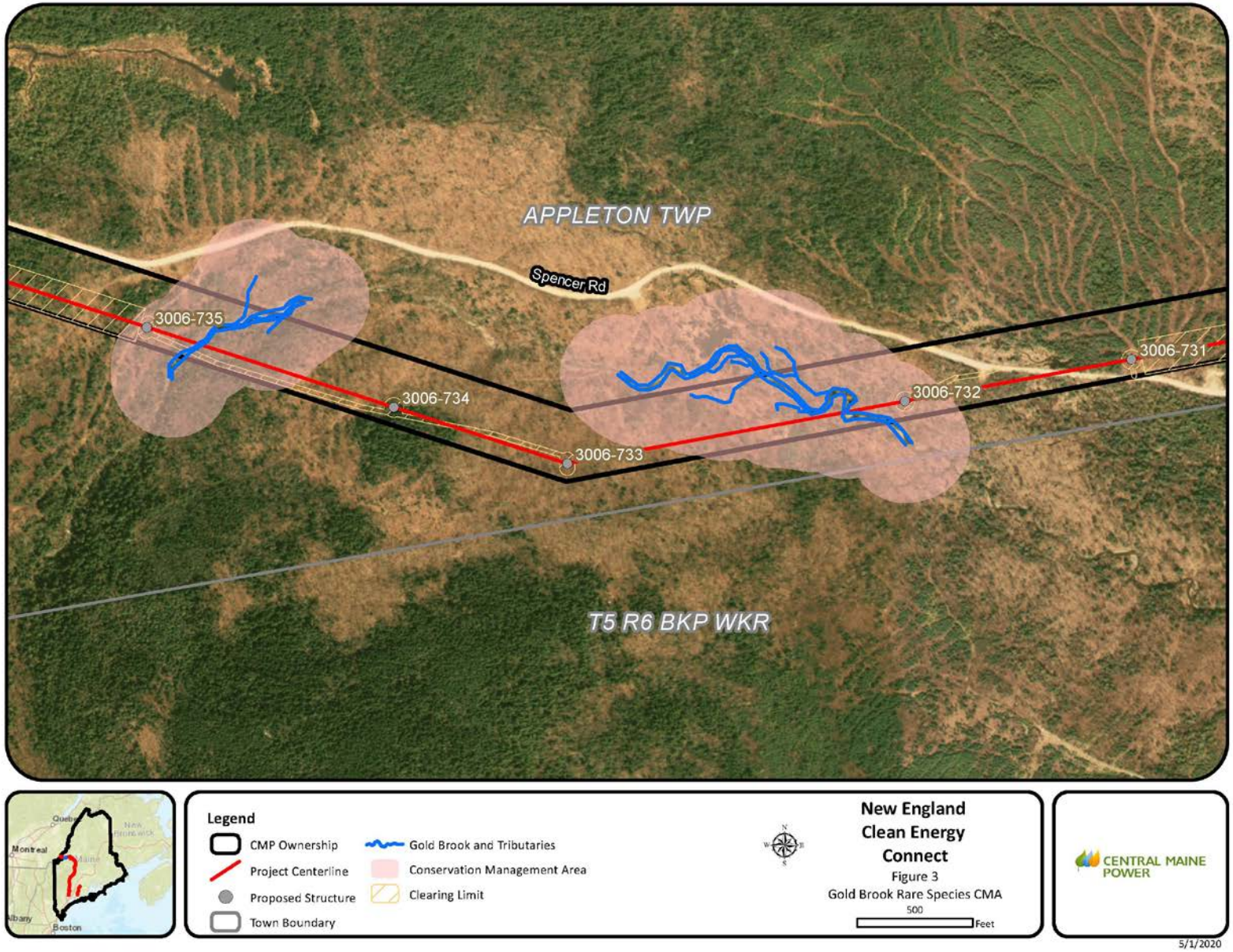
Figure 1

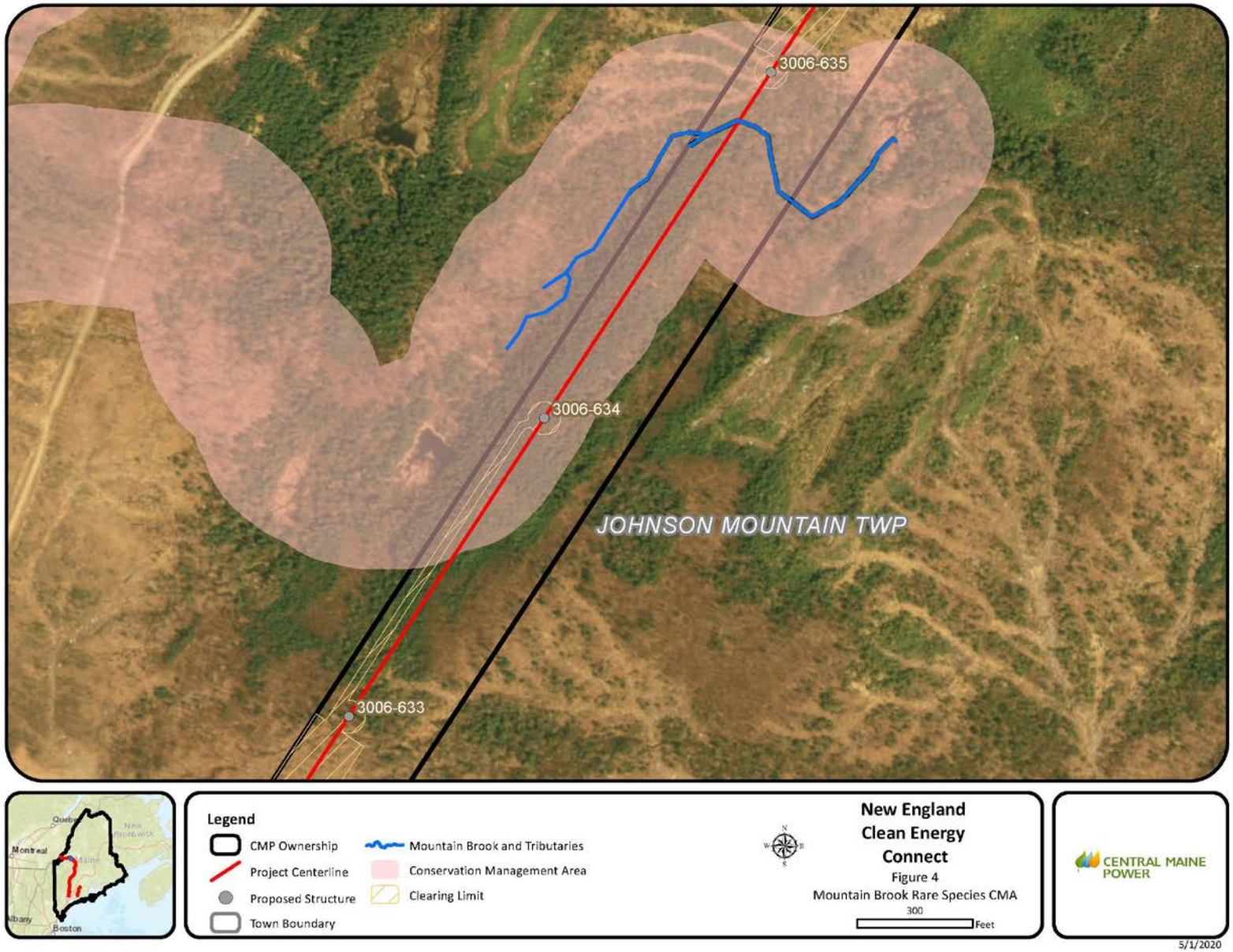


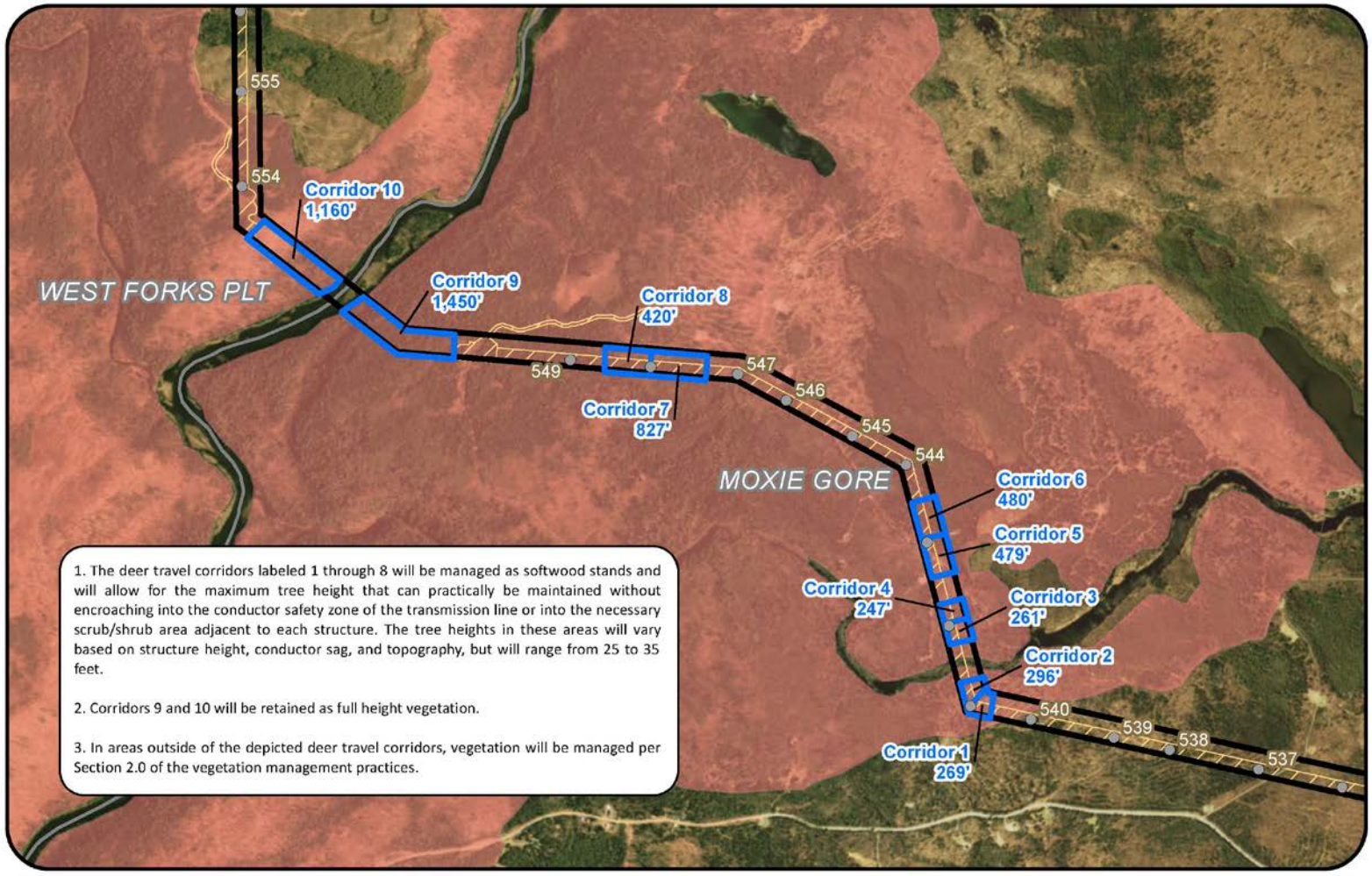
1. With the exception of the vegetation clearing practices described in Section 2.0 (i.e., full height canopy, minimum 35-foot tall trees, and vegetation tapering requirements in Segment 1) capable species, regardless of height, are cut back to ground level or treated with herbicides within the entire length and width of the transmission line corridor during scheduled vegetation maintenance (every 4 years). However, within stream buffers, only capable specimens over 10 feet tall may be cut or treated (specimens at or above this height are likely to grow into the conductor safety zone prior to the next scheduled vegetation maintenance cycle).
2. All woody vegetation over 10 feet in height and inside the wire zone, whether capable or non-capable, is cut back to ground level during scheduled vegetation maintenance.
3. Vegetation maintenance cycle may not exceed 3 years on Segment 1 without prior approval from MDEP.

Figure 2. Tapered Vegetation




APPLETON TWP
Spencer Rd
3006-735
3006-734
3006-733
3006-732
3006-731
T5 R6 BKP WKR
Legend
CMP Ownership
Project Centerline
Proposed Structure
Town Boundary
Gold Brook and Tributaries
Conservation Management Area
Clearing Limit
New England
Clean Energy
Connect
Figure 3
Gold Brook Rare Species CMA
500
Feet
CENTRAL MAINE POWER
5/1/2020


3006-635
3006-634
3006-633
JOHNSON MOUNTAIN TWP
Legend
CMP Ownership
Project Centerline
Proposed Structure
Town Boundary
Mountain Brook and Tributaries
Conservation Management Area
Clearing Limit
New England
Clean Energy
Connect
Figure 4
Mountain Brook Rare Species CMA
300
Feet
CENTRAL MAINE POWER
5/1/2020


555
554
Corridor 10
1,160'
WEST FORKS PLT
Corridor 9
1,450'
Corridor 8
420'
549
547
546
545
544
Corridor 7
827'
MOXIE GORE
Corridor 6
480'
Corridor 5
479'
Corridor 4
247'
Corridor 3
261'
Corridor 2
296'
540
539
538
537
Corridor 1
269'
1. The deer travel corridors labeled 1 through 8 will be managed as softwood stands and will allow for the maximum tree height that can practically be maintained without encroaching into the conductor safety zone of the transmission line or into the necessary scrub/shrub area adjacent to each structure. The tree heights in these areas will vary based on structure height, conductor sag, and topography, but will range from 25 to 35 feet.
2. Corridors 9 and 10 will be retained as full height vegetation.
3. In areas outside of the depicted deer travel corridors, vegetation will be managed per Section 2.0 of the vegetation management practices.
Legend
CMP Ownership
Proposed Structure
Town Boundary
Clearing Limit
Deer Travel Corridor
Deer Wintering Area
New England Clean Energy Connect
Figure 5
Upper Kennebec Deer Travel Corridors
1,500
Feet
CENTRAL MAINE POWER
5/1/2020

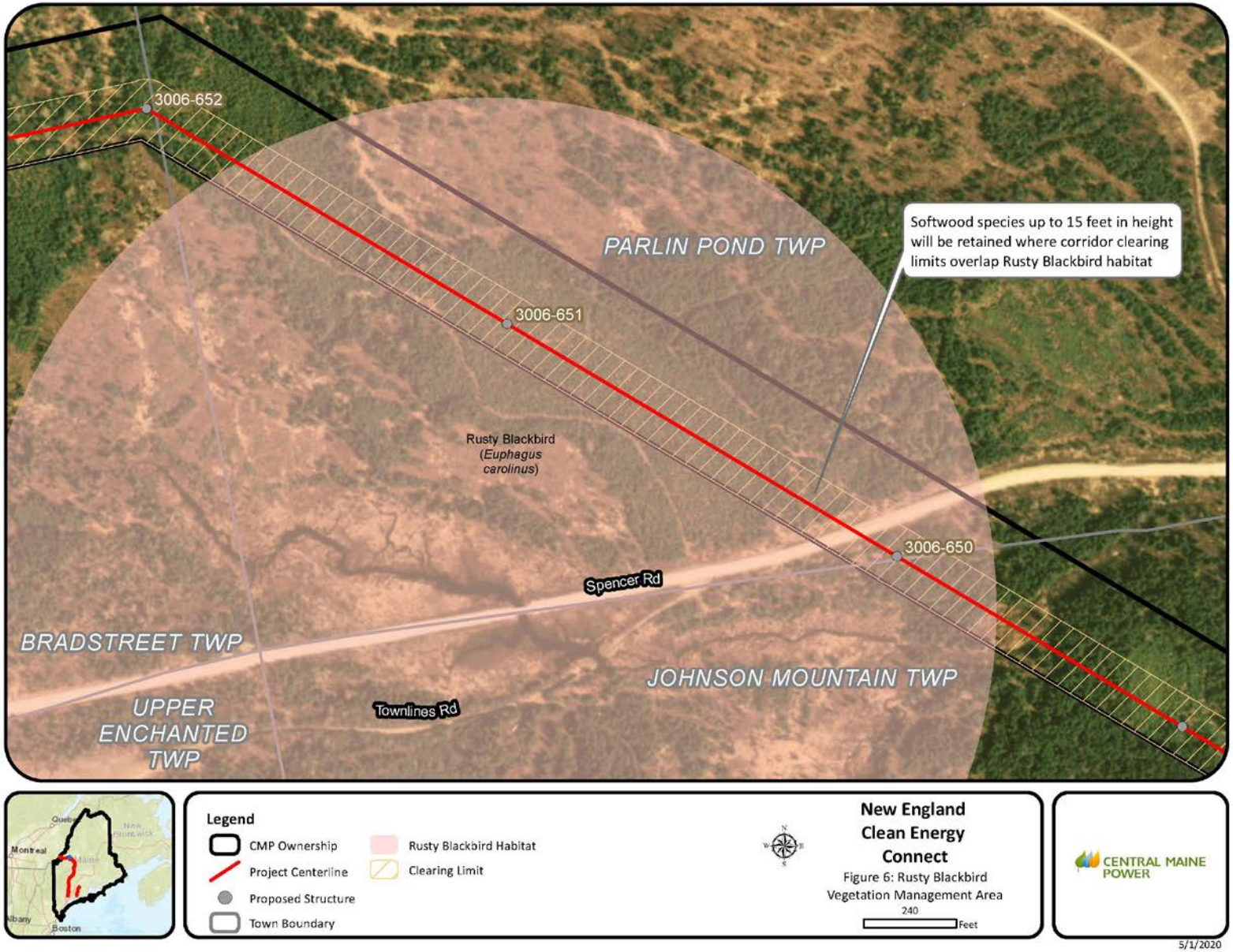

3006-652
3006-651
3006-650
PARLIN POND TWP
Softwood species up to 15 feet in height will be retained where corridor clearing limits overlap Rusty Blackbird habitat
Rusty Blackbird (Euphagus carolinus)
Spencer Rd
BRADSTREET TWP
JOHNSON MOUNTAIN TWP
UPPER ENCHANTED TWP
Townlines Rd
Legend
CMP Ownership
Project Centerline
Proposed Structure
Town Boundary
Rusty Blackbird Habitat
Clearing Limit
New England Clean Energy Connect
Figure 6: Rusty Blackbird Vegetation Management Area
240
Feet
CENTRAL MAINE POWER
5/1/2020

EXHIBIT D: NEW ENGLAND CLEAN ENERGY CONNECT POST-CONSTRUCTION VEGETATION MAINTENANCE PLAN

New England Clean Energy Connect

Post-Construction Vegetation Maintenance Plan

Prepared by:

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Revised June 2020

CENTRAL MAINE POWER

Introduction

This post-construction Vegetation Maintenance Plan (VMP) describes the restrictive maintenance requirements for protected natural resources within Central Maine Power Company's (CMP) New England Clean Energy Connect (NECEC) project transmission line corridors. The requirements described in this VMP apply to routine maintenance and are not intended to apply to emergency maintenance and/or repair actions.

The goal of this VMP is to provide maintenance personnel and contractors with a cohesive set of vegetation maintenance specifications for transmission line corridors. This VMP is intended to be used in conjunction with project As-Built Plan & Profile drawings to locate the areas where maintenance restrictions apply.

The protected natural resources and visually sensitive areas subject to restrictive and protective maintenance requirements include:

- Wetlands and streams (intermittent and perennial);
- Perennial streams within Segment 1 of the NECEC project;
- All streams within the Gulf of Maine Distinct Population Segment (GOM DPS), which includes the critical habitat ;
- Outstanding river segments, rivers, streams or brooks containing threatened or endangered species (e.g., Atlantic salmon);
- Gold Brook and Mountain Brook containing State Threatened Roaring Brook Mayfly (*Epeorus frisoni*) and / or State Special Concern Northern Spring Salamander (*Gyrinophilus porphyriticus*) species;
- State Special Concern Species Habitat: Rusty Blackbird (*Euphagus carolinus*) and Wood Turtle (*Glyptemys insculpta*);
- Significant Vernal Pools (SVP);
- Inland Waterfowl and Wading Bird Habitat (IWWH);
- Deer Wintering Areas (DWA);
- Potential maternal roosting areas for Northern Long-eared Bat (*Myotis septentrionalis*);
- Rare plant locations;
- Locations over mapped significant sand and gravel aquifers, and:
- Viewpoints from Coburn Mountain and Rock Pond.
-

In locations where individual restrictions or procedures overlap or multiple restrictions apply, the more stringent restrictions and all applicable procedures will be followed by maintenance personnel and contractors.

1.0 Right-of-Way Vegetation Maintenance Procedures

1.1 Typical Maintenance Procedures

Routine vegetation maintenance for transmission line corridors is intended to meet the following goals:

1. Maintain the integrity and functionality of the line;
2. Facilitate safe operation of the line;
3. Maintain access in case of emergency repairs; and
4. Facilitate safety inspections.

Therefore, the objectives of this VMP will be to control the growth of woody vegetation capable of encroaching into the conductor safety zone 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 (NERC) Transmission Vegetation Management[1]. This will be accomplished by practicing an integrated vegetation management strategy using a combination of hand-cutting and selective herbicide applications[2]. Mechanical mowing may be used in unusual circumstances to regain control of vegetation, should the typical procedures not suffice.

Throughout clearing and construction, shrub and herbaceous vegetation will remain in place to the extent possible. Removing capable vegetation will be done during initial transmission line corridor clearing prior to construction of the new transmission line. Follow-up maintenance activities during operation of the line require the removal of "capable species," dead trees, and "hazard trees." Capable trees are those plant species and individual specimens that are capable of growing tall enough to violate the required clearance between the conductors and vegetation established by NERC. Due to the sag of the electric transmission lines between the poles, which varies with the distance between poles, tension on the wire, electrical load, air temperature and other variables, the required clearance is typically achieved by removing all capable species during each maintenance cycle. Removing capable species vegetation allows for the maintenance of 25 feet of separation between vegetation and the lines, thereby adhering to NERC standards. Hazard trees are those trees typically on the edge of the transmission line corridor that pose an imminent threat to violating the minimum separation standard or are at risk of contacting the lines themselves. Hazard trees are typically removed immediately upon identification.

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

[2] No herbicide will be applied in the Segment 1 corridor, within 100 feet of the one observed small whorled pogonia occurrence in the Town of Greene, or within 100 feet of the 174-acre Casavant tracts on the east and west sides of the transmission line corridor in this vicinity in Greene.

More frequent vegetation management may be required within the first 3 to 4 years following construction in order to bring the vegetation under control. After this initial management period, maintenance practices are typically carried out on a 4-year cycle depending on growth, weather, geographic location, and corridor width. Maintenance may be required less frequently in the long-term as vegetation within the corridor becomes dominated by shrub and herbaceous species. Large branches that overhang the transmission line corridor and any hazard trees on the edge of, or outside of, the transmission line corridor that could contact the electrical lines or come within 15 feet of a conductor may be removed as soon as they are identified.

The following procedures will be implemented during vegetation maintenance activities to protect sensitive natural resources:

- Protected resources and their associated buffers will be flagged or located with a Global Positioning System (GPS) prior to all maintenance operations;
- Hand-cutting will be the preferred method of vegetation maintenance within buffers and sensitive areas, where reasonable and practicable;
- Equipment access through wetlands or over streams will be avoided as much as practicable by utilizing existing public or private access roads, with landowner approval where required;
- Equipment access in upland areas with saturated soils will be minimized to the extent practicable to avoid rutting or other ground disturbance;
- Significant damage to wetland or stream bank vegetation, if any, will be repaired following completion of maintenance activities in the area; and
- Areas of significant soil disturbance will be stabilized and reseeded following completion of maintenance activity in the area.

2.0 Vegetation Management – Segment 1 Specific

This section describes the four (4) types of vegetation management required along the Segment 1 corridor, which achieve:

- Full canopy height vegetation;
- Vegetation with a 35-foot minimum height;
- Deer travel corridors; and/or
- Tapered vegetation.

This section also describes riparian filter areas adjacent to rivers, streams, and brooks.

2.1 Full Canopy Height Vegetation

Full canopy height vegetation is required in three locations along the Segment 1 corridor. The locations, identified more specifically below in Table 1, include the Gold Brook crossing (within

Wildlife Area 4), the Mountain Brook crossing (Wildlife Area 6), and the Upper Kennebec River crossing (Wildlife Area 11).

In areas where full canopy height vegetation must be maintained, vegetation will be removed only in areas necessary to access pole locations and install and maintain the poles. (There are no pole locations in Wildlife Area 11.) This includes the area within the entire width of the 150-foot wide corridor. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line.

2.2 35-Foot Minimum Vegetation Height

In areas where minimum 35-foot tall vegetation must be maintained, only areas necessary to access pole locations or install and maintain poles will be cleared during construction. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line. In other areas within the entire width of the corridor only trees taller than 35 feet, or trees that may grow taller than 35 feet prior to the next scheduled maintenance, will be removed during construction. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and may not exceed a three-year cycle within any particular area within Segment 1 without prior approval from the Maine Department of Environmental Protection (MDEP).

With regard to ongoing vegetation management, trees that exceed 35 feet or are anticipated to exceed this height before the next scheduled maintenance cycle will be cut at ground level and will only be removed if leaving them in place would violate the Maine Slash Law or create a fire or safety hazard.

2.3 Deer Travel Corridors

Eight deer travel corridors must be managed as softwood stands to promote deer movement across the transmission line corridor during the winter months when snow depths have the potential to inhibit deer travel. These travel corridors are located on each side of the four structures identified in Table 1 and will extend along the corridor, under the conductors, where conductor height allows for taller vegetation within the corridor. These deer travel corridors must be designated and labeled corridors 1 through 8, and managed as softwood stands and allow for the maximum tree height that can practically be maintained without encroaching into the conductor safety zone (approximately 24 feet of clearance between the lowest conductor at maximum sag conditions and the top of vegetation) or into the necessary cleared area adjacent to each structure. Tree heights will vary based on structure height, conductor sag, and topography, but must generally range from 25 to 35 feet.

Within designated deer travel corridors 1 through 8, during the initial vegetation clearing for construction all capable hardwood species will be cut and individual softwood specimens will be cut to heights necessary so that they do not intrude into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance. On an ongoing basis, softwood specimens that are not intruding into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance will be retained. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line.

Table 2-1

Area Name	From Structure	To Structure	Location	Min. Veg Height	Notes	Approximate Length (miles)
Wildlife Area 1	3006-800	3006-799	Beattie Twp	35'	Includes Number One Brook not visible from Beattie Pond	0.22
Wildlife Area 2	3006-771	3006-765	Skinner Twp	35'	Includes crossing of the South Branch of the Moose River (all of TNC 2)	1.19
Wildlife Area 3	3006-758	3006-752	Skinner Twp Appleton Twp	35'	Includes five perennial streams and four intermittent streams	1.25
Wildlife Area 4	3006-742	3006-731	Appleton Twp	35' (except full canopy height at Gold Brook crossing)	Includes Gold Brook crossing (structures 3006-735 to 3006-732) and Roaring Brook Mayfly habitat adjacent to that crossing where full canopy height vegetation is required, as well as group of 5 unnamed streams; portions adjacent to Leuthold Preserve	2.18
Wildlife Area 5	3006-708	3006-683	Hobbstown Twp T7 BKP WKR Bradstreet Twp	35'	Includes area near Moose Pond and surrounding land owned by BPL, Whipple Brook crossing, areas adjacent to Leuthold Preserve, and unnamed stream crossing where topography may allow crossing without taller poles (structures 3006-708 to 3006-707)	4.87
Wildlife Area 6	3006-635	3006-633	Johnson Mtn Twp	Full canopy height	Mountain Brook crossing, includes Roaring Brook Mayfly habitat	0.38
Wildlife Area 7	3006-598	3006-597	Johnson Mtn Twp	35'	Cold Stream crossing; adjacent to Cold Stream Forest Tract	0.23
Wildlife Area 8	3006-589	3006-588	Johnson Mtn Twp	35'	Unnamed stream crossing where 35-foot vegetation likely can be maintained without taller poles	0.2
Wildlife Area 9	3006-576	3006-563	West Forks	35'	Includes Tomhegan Stream crossing and adjacent to Cold Stream Forest Tract	2.21

Area Name	From Structure	To Structure	Location	Min. Veg Height	Notes	Approximate Length (miles)
Wildlife Area 10	3006-542	3006-541	Moxie Gore	35'	Moxie Stream crossing where 35-foot vegetation likely can be maintained without taller poles	0.19
Wildlife Area 11	Eastern edge of clearing for the HDD Termination Station in West Forks	Western edge of clearing for the HDD Termination Station in Moxie Gore	West Forks Moxie Gore	Full canopy height	Upper Kennebec River crossing; deer travel corridors 9 and 10	0.56
Wildlife Area 12						
	3006-548		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 7 and 8	0.23
	3006-543		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 5 and 6	0.18
	3006-542		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 3 and 4	0.09
	3006-541		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 1 and 2	0.1

Total distance along the Segment 1 corridor with taller vegetation is approximately 14.08 miles.

2.4 Tapered Vegetation

Tapered vegetation is required along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors is required. In Wildlife Area 12 taller vegetation is required for deer travel corridors 1 through 8. Within this wildlife area, tapering is required along the transmission line corridor in the sections outside the deer travel corridors. For example, the section of the transmission line corridor between structures 3006-542 and 3006-543 that is not within a deer travel corridor must be tapered.

"Tapering" refers to a form of vegetation management along the transmission line corridor where increasingly taller vegetation is allowed to grow as the distance from the wire zone increases (see Figure 2 of this Exhibit.).

Along Segment 1 where tapering is required, the transmission line includes two conductors running parallel to each other and separated by 24 feet. A shield wire runs over each conductor. The wire zone is the 54-foot wide area that runs along the center of the 150-foot wide corridor and includes the 24-foot wide area below and between the two conductors, plus 15 feet on each side of the set of conductors (15 ft. + 24 ft. + 15 ft. = 54 ft.).

In a tapered corridor, within this 54-foot wide wire zone all woody vegetation will be cut to ground level during construction. During maintenance of this portion of the corridor only non-capable species are allowed to grow (capable species includes woody species and specimens capable of growing tall enough to reach into the conductor safety zone). Within a tapered corridor, the result is that within the 54-foot wide wire zone vegetation that is approximately 10 feet tall regenerates so that the wire zone primarily consists of native, scrub-shrub habitat with non-capable species.

In a tapered corridor, the area outside the wire zone will be selectively cut during construction to create a taper with vegetation approximately 15 feet tall near the wire zone and increasing to approximately 35 feet tall near the edge of the 150-foot wide corridor. The first taper includes the areas within 16 feet of each side of the wire zone, within which vegetation 15 feet tall and under, including capable species, will be maintained. The second taper includes the next 16 feet on each side of the corridor, within which taller vegetation up to 25 feet tall will be maintained. The third and final taper includes the next 16 feet on each side of the corridor, within which taller vegetation up to 35 feet tall will be maintained.

As vegetation is maintained within a tapered corridor, any trees that exceed the designated height for the taper they are within, or are anticipated to exceed the height before the next scheduled

maintenance cycle, will be cut at ground level. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and may not exceed a three-year cycle within any particular area without prior approval from the Department. Any trees that are cut will only be removed if leaving them in place would violate the Maine Slash Law or create a fire or safety hazard.

The overall result is that a cross section of a 150-foot wide tapered corridor breaks down into the following components:

16’ 3rd taper + 16’ 2nd taper + 16’ 1st taper + 54’ wire zone + 16’ 1st taper + 16’ 2nd taper + 16’ 3rd taper = 150’ wide corridor. The approximate maximum vegetation height of each taper is:

- 1st taper: 15-feet
- 2nd taper: 25-feet
- 3rd taper: 35-feet

Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line. Soil disturbance and grading will be minimized through careful planning of temporary access ways. When the temporary access ways are removed, the disturbed areas will be restored to their pre-construction grade and allowed to revegetate. Except for the areas immediately around the base of each transmission line structure, the full width and length of the transmission corridor will remain vegetated following construction of the Project.

2.5 Riparian Filter Areas

Unless more restrictive requirements apply[3], within 100 feet of all perennial streams in Segment 1, all coldwater fisheries streams as identified in Waterbody Crossing Table, all streams containing threatened or endangered species, and all Outstanding River Segments; and within 75 feet of all other streams, a riparian filter area will be maintained. Riparian filter areas will be established and maintained in the following manner:

- The boundary of each riparian filter area will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot filter area prior to clearing. Flagging will be maintained throughout construction.

[3] More restrictive requirements include, but are not limited to, requirements to maintain taller vegetation within the corridor such as provided for in Table 1.

- Foliar herbicides will be prohibited within the riparian filter area, and all refueling/maintenance of equipment will be excluded from the filter area unless it occurs on an existing paved road or if secondary containment is used with oversight from an environmental inspector.
- All stream crossings by heavy equipment will be performed through the installation of equipment spans with no in-stream disturbances. Streams will not be forded by heavy equipment.
- Within that portion of the appropriate riparian filter area that is within the wire zone (i.e., within 15 feet, horizontally, of any conductor), all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut back to ground level and resulting slash will be managed in accordance with Maine's Slash Law. No other vegetation, other than dead or hazard trees, will be removed. Within the riparian filter area and outside of the wire zone, non-capable species may be allowed to exceed 10 feet in height unless it is determined that they may encroach into the conductor safety zone prior to the next maintenance cycle. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and must not exceed a three-year cycle within any particular area within this segment without prior approval from the Department. Vegetation maintenance within other segments will be on an approximately four-year cycle.
- Removal of capable species, dead or hazard trees within the appropriate riparian filter area will typically be accomplished by hand-cutting. Use of mechanized harvesting equipment is allowed if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent practicable; within the wire zone, all woody vegetation may be cut to ground level.
- Any maintenance access roads that must cross streams or brooks must be designed, constructed, and maintained to minimize erosion and sedimentation.

3.0 Vegetation Maintenance Methods – All Transmission Line Corridor Areas

3.1 Mechanical Methods

During routine vegetation maintenance after construction, mechanical methods of maintaining the height of vegetation on the transmission line corridor will consist primarily of cutting with hand tools, with occasional use of chainsaws and limited use of motorized equipment in areas directly accessible from public or private access roads.

Maintenance procedures will be to cut all capable species and any dead or hazard trees at ground level except in designated areas, as described below. Large vegetation cut during routine maintenance will be handled in accordance with the Maine Slash Law[4]. Any wood that is

4 12 M.R.S. §§ 9331 et seq.

chipped and spread on the corridor shall be left in layers no more than two inches thick, as measured above the mineral soil surface.

Additionally, as a conservation effort to protect the Northern Long-eared Bat, CMP will suspend vegetation maintenance activities for trees greater than 3 inches diameter at breast height during the maternity roost season of June 1 to July 31.

3.2 Herbicide Application

With the exception of the Segment 1 (new corridor) portion of the Project, and within the full width and length of the corridor containing transmission line structures 3006-24 to 3006-29.1[5], herbicide application will be used in conjunction with the mechanical methods of vegetation maintenance. The herbicide application program is consistent with most New England utilities and consists of direct application to targeted species and specimens along the transmission line corridor with a low-volume foliar herbicide or application of herbicides to cut stumps and surfaces of larger trees. Direct application to individual plant species, as opposed to a broadcast spray, will control only the targeted woody vegetation allowing low-growing plant communities (the desired shrub and herbaceous species) to thrive. Herbicides will also be selectively applied to minimize the impacts to non-target species. Aerial application will not be used. Only herbicides which are registered with and approved by the U.S. Environmental Protection Agency (EPA-approved) and registered with the Maine Board of Pesticides Control (BPC) will be used.

Herbicide applications will likely begin the first year after construction is completed to gain control of vegetation growth (with the exception of areas listed below where no herbicides will be applied). When control is achieved, treatment will typically occur on a 4-year cycle or as needed. By using selective herbicides and a variety of application methods, vegetation along the transmission line corridor will eventually consist of a dense, low-growing plant community that will discourage the establishment of tree species. Therefore, fewer woody species will require treatment in future applications.

The following procedures and restrictions will be implemented during herbicide applications:

- No herbicides or pesticides will be used in Segment 1 (new corridor) of the Project.
- No herbicides will be used within the full width and length of the transmission line corridor adjacent to the 174-acre parcel near Allen Pond in Greene, i.e., the portion of the corridor containing transmission line structures 3006-24 to 3006-29.1.

[5] No herbicide will be applied within 100 feet of the one observed small whorled pogonia occurrence in the Town of Greene, or within 100 feet of the 174-acre Casavant tracts on the east and west sides of the transmission line corridor in this vicinity in Greene.

- Herbicides will be used in strict accordance with the manufacturer's EPA-approved labeling and will not be applied directly to waterbodies or areas where surface water is present.
- Throughout the Project corridor no foliar herbicides will be applied within a 100-foot buffer on all coldwater fishery[6] streams, or within a 75-foot buffer on intermittent streams.
- In co-located sections outside the GOM DPS, foliar herbicides will not be applied within 75 feet of rivers, streams, brooks, lakes, ponds, or within 25 feet of wetlands that have water present at the surface at the time of the application.
- For all streams within the GOM DPS which includes the critical habitat, streams and rivers classified as a coldwater fishery, and outstanding river segment or containing threatened or endangered species (e.g., Atlantic salmon), foliar herbicides will not be applied within a 100-foot buffer. This requirement extends to all streams within the Project transmission line corridor, regardless of classification, located immediately west of Moxie Pond.;
- Herbicides will not be mixed, transferred or stored within 100 feet of any wetland or surface water, unless done so on a public access road;
- Herbicides will not be mixed, transferred or stored within 100 feet of Significant Vernal Pool depressions, unless done so on a public access road;
- Herbicides will not be mixed, transferred or stored over mapped significant sand and gravel aquifers unless done so on a public access road;
- Herbicides will not be applied, mixed, transferred or stored within 100 feet of any known private well or spring or within 200 feet of any known public water supply well, unless done so on a public access road
- When herbicide applications are performed in wetlands without standing water, only herbicides approved for use in wetland environments will be used;
- Herbicides will not be applied to any area when it is raining or when wind speed exceeds 15 miles per hour as measured on-site at the time of application. When wind speeds are below 3 miles per hour, applicators should be aware whether a temperature inversion is present, and should consult the herbicide label to determine whether application should proceed under these conditions;
- The foreman or licensed applicator on each herbicide application crew will be licensed by the Maine BPC and will remain in eye contact and within earshot of all persons on his/her crew applying herbicides. At least one individual from any company applying herbicides must also hold a Commercial Master Applicator License issued by the BPC. This Master Applicator must have the ability to be on-

[6] The term coldwater fishery, as used in this document, pertains to streams that are known to contain brook trout as designated by the Maine Department of Inland Fisheries and Wildlife.

site to assist persons applying herbicides within six hours driving time. If an out-of-state company is conducting the herbicide application, the company must have a Master Applicator in Maine during any application. Application of herbicides will be in accordance with applicable regulations promulgated under the Maine Pesticides Control Act, including those regulations to minimize drift, to maintain setbacks from sensitive areas during application, and to maintain setbacks from surface waters during the storing/mixing/loading of herbicides; and

- Herbicides will typically be mixed in a truck-mounted tank that remains on public access roads. Herbicide application is done by personnel with low-volume, hand-pressurized (manual) backpacks with appropriate nozzles, to minimize drift, who travel along the transmission line corridor by foot or by all-terrain vehicle and spot-treat target species and specimens.

The location of all streams, wetlands, significant vernal pools, rare plant locations, known wells, and mapped significant sand and gravel aquifers crossed by the transmission line corridor will be shown on the As-Built Plan & Profile drawings. GIS shapefiles will also be maintained with the location of these resources and will be provided to maintenance personnel. The presence of surface water will be determined prior to herbicide use in any wetland or waterbody. Crew leaders will assure that resources and buffers are clearly marked in the field, or that locations of resources and buffers are provided as GIS/GPS data prior to initiation of an herbicide application for clear identification by the applicators.

3.3. Petroleum Products & Hazardous Materials Management

Any petroleum products or other hazardous material within the transmission line corridor during construction will be managed in accordance with CMP's Environmental Control Requirements for Contractors and Subcontractors – Oil and Hazardous Material Contingency Plan (see Exhibit 15-1 of the NECEC Site Law Application) and will include the following setbacks unless CMP can demonstrate that, due to special circumstances at specified locations, these setbacks are impractical at those locations:

(a) No fuel storage, vehicle/equipment parking and maintenance, and refueling activity may occur within 100 feet of a protected wetland or other waterbody, unless no practicable alternative exists and secondary containment with 110% capacity is provided for any fuel storage containers or tanks, or if it occurs on a paved road.

(b) No fuel storage, vehicle/equipment parking and maintenance, and refueling activity may occur within 200 feet of a known private water supply.

(c) No fuel storage, vehicle/equipment parking and maintenance, and refueling activity may occur within 400 feet of a known public water supply.

(d) No fuel storage, vehicle/equipment parking and maintenance and refueling activity may occur within 25 feet minimum of the following:

(i) An area listed in Maine's biological conservation data system, Biotics, of the Maine Natural Areas Program, including rare natural communities and ecosystems (state rarity rank of S1 through S3 and habitats supporting Endangered or Threatened plant species). Boundaries and locations are as determined by the Maine Natural Areas Program of the Department of Agriculture, Conservation and Forestry.

(ii) Habitat of any species declared rare, threatened or endangered by the Maine Department of Inland Fisheries and Wildlife, Maine Department of Marine Resources, or the Director of the U.S. Fish and Wildlife Service.

4.0 Vegetation Maintenance within Freshwater Wetlands

Transmission line corridor wetlands range in type from small, emergent wetlands formed in ruts from logging equipment to large forested wetland systems. No specific buffers are proposed for the wetlands identified within the transmission line corridor.

4.1 Additional Vegetation Maintenance Restrictions within and Adjacent to Freshwater Wetlands

Vegetation maintenance within, and within 25 feet of, freshwater wetlands with standing water will be conducted only by hand cutting with hand tools or chainsaws. Herbicide use is permitted in wetlands only when no standing water is present in the wetland at the time of the application. Herbicides will not be stored, mixed, transferred between containers, and no refueling of chain saws or other equipment will be allowed, within 100 feet of freshwater wetlands, unless done so on a public access road.

5.0 Vegetation Maintenance within Stream Buffers (Riparian Filter Areas)

A 75-foot buffer, as measured from the top of each stream bank, will be established for vegetation maintenance along perennial and intermittent streams not designated as coldwater fisheries, within the transmission line corridor. Additional restrictions will be applied within 100 feet of streams meeting certain criteria, as described below. Special restrictions will apply within these stream buffers during vegetation maintenance.

This section describes the restrictions related to vegetation cutting and maintenance within these stream buffers. All vegetation maintenance procedures and restrictions that apply to typical transmission line corridor maintenance also apply within stream buffers.

5.1 Additional Vegetation Maintenance Restrictions within Stream Buffers

The following additional restrictions apply to vegetation maintenance within stream buffers:

- 100-foot buffers will be established for all perennial streams within Segment 1 of the Project.

- 100-foot buffers will be established for a streams within the GOM DPS which includes the critical habitat.

- 100-foot buffers will be established for all coldwater fishery streams, outstanding river segments, and rivers, streams, or brooks containing threatened or endangered species (e.g., Atlantic salmon), unless the Department determines that the functions and values of the buffer will not be impacted by the removal of vegetation and approves an alternative minimum buffer. In no case may this buffer be reduced to less than 25 feet.

- In the area adjacent to Moxie Pond in Segment 2, CMP will maintain the project with 100-foot riparian filter area identical to the riparian filter areas adjacent to coldwater fishery streams in Segment 1.

- The boundary of each stream buffer will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot stream buffer prior to vegetation management activities.

- Within that portion of the appropriate stream buffer that is within the wire zone (i.e., within 15 feet, horizontally, of any conductor; see Figure 1), all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut back to ground level and resulting slash will be managed in accordance with Maine's Slash Law, unless otherwise specified for portions of Segment 1, beginning on page 3 of this plan. No other vegetation, other than dead or hazard trees, will be removed;
- Removal of capable species, dead or hazard trees within the appropriate stream buffer will be accomplished by hand-cutting only. Mechanized harvesting equipment will not be used;
- Herbicides will not be applied within 75-foot or 100-foot stream buffers;
- Herbicides will not be stored, mixed or transferred between containers within 100 feet of streams, unless done so on a paved public access road;
- No refueling or maintenance of equipment, including chainsaws, will occur within 100 feet of streams, unless done so on a paved public access road; and
- No slash will be left within 50 feet of the edge of any stream.

These additional restrictions will allow for taller vegetation within the appropriate stream buffer to provide shading and to reduce the warming effect of direct sunlight (insolation). Low ground cover vegetation will also remain to filter any sediment in surface runoff. The restrictions are also intended to minimize ground disturbance and prevent or minimize the surface transport of herbicides and petroleum products to streams. These restrictions will allow the stream buffers to provide functions and values similar to those provided prior to transmission line construction.

5.2 Vegetation Maintenance within the Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas of Mountain Brook and Gold Brook

During consultation with the Maine Department of Inland Fisheries and Wildlife (MDIFW) for the NECEC project, MDIFW identified Gold Brook (PSTR 15-06, PSTR 16-07, PSTR 16-10 and PSTR 16-15) and Mountain Brook (PSTR-33-01, PSTR-EM-34-01, PSTR-EM-34-01) as high priority resources in which full height vegetation should be retained within the 250 foot conservation management areas (CMA) to protect habitat for Roaring Brook Mayfly and Northern Spring Salamander. Mountain Brook contains both Roaring Brook Mayfly and Northern Spring Salamander habitat, while field survey results concluded that Gold Brook only contains Roaring Brook Mayfly habitat.

Installation of taller structures will facilitate the retention of full height vegetation within these CMAs. Although CMP will retain full height vegetation within these CMAs, CMP will selectively cut at ground level and remove any trees within these CMAs that are intruding into the conductor safety zone or are at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance.

Access roads and structure preparation/installation areas within these conservation management areas will be maintained as scrub-shrub habitat to allow for maintenance, repair and/or emergency access. All other areas depicted on Figure 3 and Figure 4 will be retained as full height vegetation.

6.0 Vegetation Maintenance within Significant Vernal Pool Buffers

Vegetated buffers of 100 feet, as measured from the edge of the pool depression, will be established for SVPs crossed by the transmission line corridor. Vegetation maintenance within the SVP buffers will be subject to the same procedures and prohibitions, as applicable, which are required in the typical transmission line corridor, as well as to the additional measures below.

6.1 Additional Vegetation Maintenance Restrictions within Significant Vernal Pool Buffers

The following additional restrictions apply to vegetation maintenance within SVP buffers:

- Mechanized equipment will not be allowed within the vernal pool depression, unless the depression encompasses the entire width of the transmission line corridor. Mechanized equipment will only be allowed to cross the vernal pool depressions during frozen or dry conditions or with the use of mats;
- Between April 1 and June 30 in any calendar year, no vegetation maintenance using tracked or wheeled equipment will be performed within the 100-foot buffer. Maintenance will be performed using only hand tools during this period;
- Between April 1 and June 30 in any calendar year, no vegetation maintenance will occur within 25 feet of the SVP pool depression;

- No refueling or maintenance of equipment, including chainsaws, will occur within 100 feet of SVP pool depression, unless done so on a public access road; and
- No herbicide use is permitted within 25 feet of the SVP pool depression.

7.0 Vegetation Maintenance within Moderate or High Value Inland Waterfowl and Wading Bird Habitat

Inland Waterfowl and Wading Bird Habitats (IWWH) are habitats mapped by the MDIFW that contain an inland wetland complex used by waterfowl and wading birds, plus a 250-foot nesting habitat area surrounding the wetland. The nesting habitat is considered to be part of the mapped IWWH. No additional buffers are proposed for IWWHs beyond this mapped habitat, and as such the vegetation maintenance restrictions apply to the mapped habitat only.

Vegetation maintenance within the IWWH will be subject to the same procedures and prohibitions, as applicable, which are required in the typical transmission line corridor and for stream buffers.

7.1 Additional Vegetation Maintenance Restrictions within Inland Waterfowl and Wading Bird Habitat

The following additional restrictions apply to vegetation maintenance within mapped IWWH:

- Between April 15 and July 15, use of motorized vehicles (e.g., all-terrain vehicles) and mechanized equipment (e.g., chainsaws or brush cutters) within IWWH is prohibited. Use of non-mechanized hand tools is allowed during this time period;
- No refueling or maintenance of equipment, including chainsaws, will occur within the IWWH, unless done so on a public access road; and
- No herbicide use is permitted within 25 feet of any wetland within the mapped IWWH.
- •Provided they do not pose a safety hazard, naturally occurring snags within IWWH will be allowed to remain, at a minimum of two to three snags per acre.

8.0 Vegetation Maintenance within Mapped Deer Wintering Areas

Deer Wintering Areas (DWA) provide important refuge for white-tailed deer (*Odocoileus virginianus*) during the winter months in northern climates and are typically characterized by an extensive stand of mature softwood species with a dense forest canopy.

With the exception of the Upper Kennebec DWA, described below, no additional vegetation maintenance restrictions are proposed within mapped DWAs, as all capable species must be removed from these and other areas within the transmission line corridor in order to comply with NERC Transmission Vegetation Management standards.

8.1 Additional Vegetation Maintenance Restrictions within the Upper Kennebec Deer Wintering Area

As a result of consultation with MDIFW for the NECEC Project, CMP has identified and designated ten deer travel corridors within the Upper Kennebec River DWA (Map ID 060065), as shown in Figure 5 of this exhibit, which will be managed as softwood stands to promote deer movement across the transmission line corridor during the winter months when snow depths have the potential to inhibit deer travel. The NECEC transmission line corridor traverses this DWA from a point in The West Forks Plantation to a point in Moxie Gore. CMP has agreed to manage these deer travel corridors, designated and labeled Corridors 1 through 8 in Figure 5, as softwood stands and will allow for the maximum tree height that can be practically maintained without encroaching into the conductor safety zone of the transmission line or into the necessary scrub/shrub area adjacent to each structure. Tree heights in these areas will vary based on structure height, conductor sag, and topography, but will generally range from 25 to 35 feet. Vegetation within Corridors 9 and 10, which are located where the transmission line will be buried using horizontal directional drilling, will be allowed to grow to its full height.

Within designated deer travel corridors 1 through 8, during routine vegetation maintenance, hardwood and softwood species that are intruding into the conductor safety zone or are at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance will be cut at ground level and removed. Softwood specimens that are not intruding into the conductor safety zone, and are not at risk of growing into the conductor safety zone prior to the next scheduled maintenance, will be retained. Access roads and structure preparation and installation areas will be maintained as scrub-shrub habitat to allow for maintenance, repair, and/or emergency access. The designated deer travel corridors will be flagged prior to maintenance activities and identified in a database maintained by CMP, further described below in Locating and Marking Buffers and Habitats.

9.0 Vegetation Maintenance within State mapped Rusty Blackbird Habitat

In consultation with MDIFW for the NECEC project, CMP agreed to allow for the retention of 10-15-foot tall spruce/fir vegetation within the Rusty Blackbird habitat, shown in Figure 6. The additional height will avoid project impacts to the habitat of this State Species of Special Concern. Additionally, tapered vegetation as described above, is required in this habitat.

Vegetation clearing activity is prohibited in this habitat between April 30 and June 30. During routine vegetation maintenance, hardwood and softwood specimens that are taller than 15 feet or are anticipated to grow taller than 15 feet prior to the next scheduled vegetation maintenance, will be cut at ground level. Spruce/fir vegetation 10-15 feet in height will be retained. The access roads and structure preparation areas within the Rusty Blackbird habitat will be maintained as scrub-shrub habitat to allow for maintenance, repair and/or emergency access. The habitat will

be flagged prior to construction and identified in a database maintained by CMP, further described below in *Locating and Marking Buffers and Habitats*.

10.0 Vegetation Maintenance within Rare Plant Locations

Vegetation maintenance of the transmission line corridor has the potential to impact rare plants and/or alter their habitat. The following additional vegetative maintenance restrictions will minimize impacts to rare plants. The additional restrictions will apply only to the demarcated locations of the identified rare plants. No additional buffers will be established surrounding rare plant locations. These restrictions are intended to maintain existing hydrology and limit soil disturbance within rare plant locations.

10.1 Additional Vegetation Maintenance Restrictions within Rare Plant Locations

The following additional restrictions will apply to vegetation maintenance for the species listed above in the identified location:

- All capable tree species will be cut by hand (chainsaws, hand saws or axes). No other mechanized cutting equipment shall be used within these habitats;
- Unless rare plant locations encompass the entire width of the transmission line corridor, mechanized equipment will only be allowed to cross rare plant locations during frozen conditions or with the use of mats;
- No refueling or maintenance of equipment, including chainsaws, will occur within demarcated rare plant locations, unless done on a public access road; and
- No foliar herbicide use is permitted within the demarcated rare plant locations, however cut surface herbicides may be used on capable species and specimens.
- No herbicides will be used within the full width and length of the transmission line corridor adjacent to the 174-acre Casavant parcel near Allen Pond in Greene, i.e., the portion of the corridor containing transmission line structures 3006-24 to 3006-29.1;
- Crossing of rare plant locations with mechanized equipment:

  All-Terrain Vehicles (ATVs)

  - Due to small footprint, relatively light weight, and infrequency of use, ATV impact is minimal, therefore crane mats will not be used.
  - If rare plants do not encompass entire ROW width, ATVs will avoid/travel around rare plants.
  - If rare plants encompass entire ROW width:
    - ATVs will utilize existing rare plant travel path/crossing if one exists.
    - If no rare plant crossing exists, ATVs will cross at narrowest point of the rare plants and will restrict this crossing to a single travel lane.

  Heavy Equipment/Vehicles

- During emergency repair & maintenance work, crane mats will not be used. Heavy equipment/vehicles will utilize existing rare plant crossings if available.
- During planned repair & maintenance work:
    - If rare plants do not encompass entire ROW width, heavy equipment/vehicles will avoid/travel around rare plants. Crane mats will not be used.
    - If rare plants encompass entire ROW width, and there is an established travel path/crossing through the rare plants, heavy equipment/vehicles will utilize this crossing, and crane mats will not be used.
    - If rare plants encompass entire ROW width, but there is no established travel path through the rare plants, heavy equipment/vehicles will cross rare plants using crane mats.

11.0 Maintenance Procedures for Mapped Significant Sand and Gravel Aquifers

Transmission lines located over mapped significant sand and gravel aquifers are subject to the typical transmission line corridor maintenance procedures, except that no refueling or maintenance of equipment, and no herbicides may be mixed, transferred or stored, over the mapped significant sand and gravel aquifers, unless done so on a public access road.

12.0 Maintenance Procedures in Tapered Vegetation Management Areas

In consultation with MDEP and the LUPC, CMP determined that management of vegetation in a tapered configuration and manner was appropriate in order to minimize the visual impact from viewpoints on the summit of Coburn Mountain in Upper Enchanted Township and from Rock Pond looking towards Three Slide Mountain in T5 R6 BKP WKR. These areas include the following coordinates:

Coburn Mountain – From: 45°25'45.01"N, 70° 6'8.22"W To: 45°27'37.45"N, 70° 6'51.44"W

Rock Pond – From: 45°27'48.24"N, 70°25'31.82"W To: 45°27'54.92"N , 70°26'3.11"W

Vegetation outside of the wire zone in these locations 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 (every 2 to 3 years in Segment 1; every 4 years elsewhere) 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.

13.0 Locating and Marking Buffers and Habitats

A database will be maintained, including maps and GIS shapefiles, of the buffers, restricted habitats, and sensitive areas and their locations relative to the nearest structure (pole) or road location. The distance and direction from the nearest structure to the sensitive area will be included with the name of the area and the structure number. All structures along the transmission line corridor will be numbered at the time of construction.

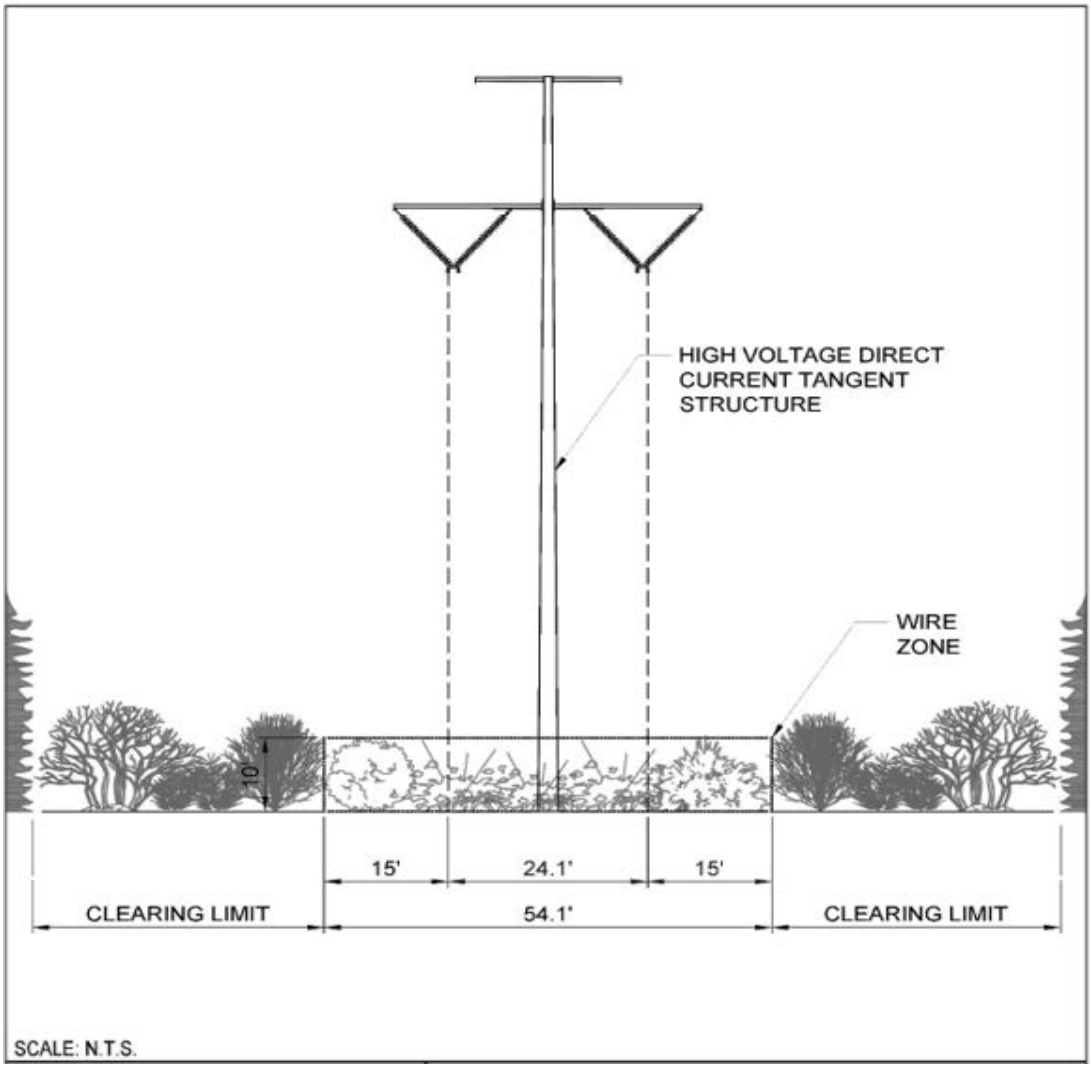
To aid in identifying restricted areas, buffers and restricted habitats may be located and demarcated in the field using brightly colored flagging or signage prior to the initiation of maintenance activities along the transmission line corridor. Alternatively, use of GIS data and GPS equipment may be used to provide accurate location of resources and associated buffers during maintenance activities. If desired, maintenance personnel may permanently demarcate restricted habitats to aid in long-term maintenance activities. Maintenance contractors working on the transmission line corridor will be provided a copy of this VMP. Use of this VMP in conjunction with the As-Built Plan & Profile drawings will enable maintenance contractors to locate and mark restricted areas in the field.

14.0 Maintenance Personnel Training

Personnel who will conduct vegetation maintenance activities on the transmission line corridor will receive appropriate environmental training before being allowed access to the transmission line corridor. Maintenance personnel will be required to review this VMP prior to the training and before conducting any maintenance activities. The level of training will be dependent on the duties of the personnel. The training will be given prior to the start of maintenance activities. Replacement or new maintenance personnel that did not receive the initial training will receive similar training prior to performing any maintenance activities on the transmission line corridor.

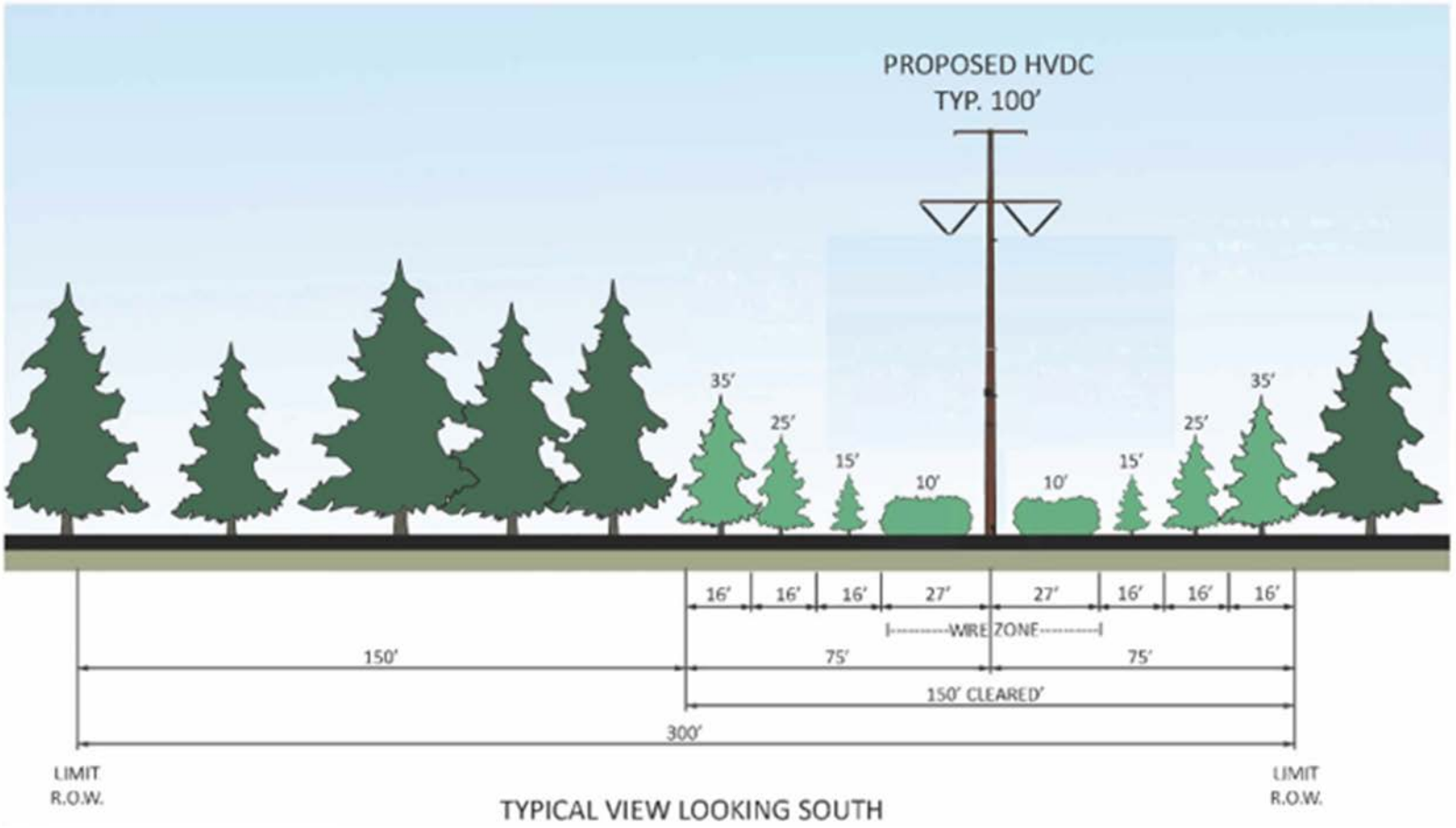
The training session will consist of a review of the buffers and restricted habitats, the respective maintenance requirements and restrictions for each, and a review of how these areas and resources can be located in the field. Training will include familiarization with and use of GIS information and sensitive natural resource identification in conjunction with the contents of this VMP, as well as basic causes, preventive and remedial measures for contamination, and erosion and sedimentation of water resources. Training will also include a review of safety and the proper use of appropriate maintenance tools.

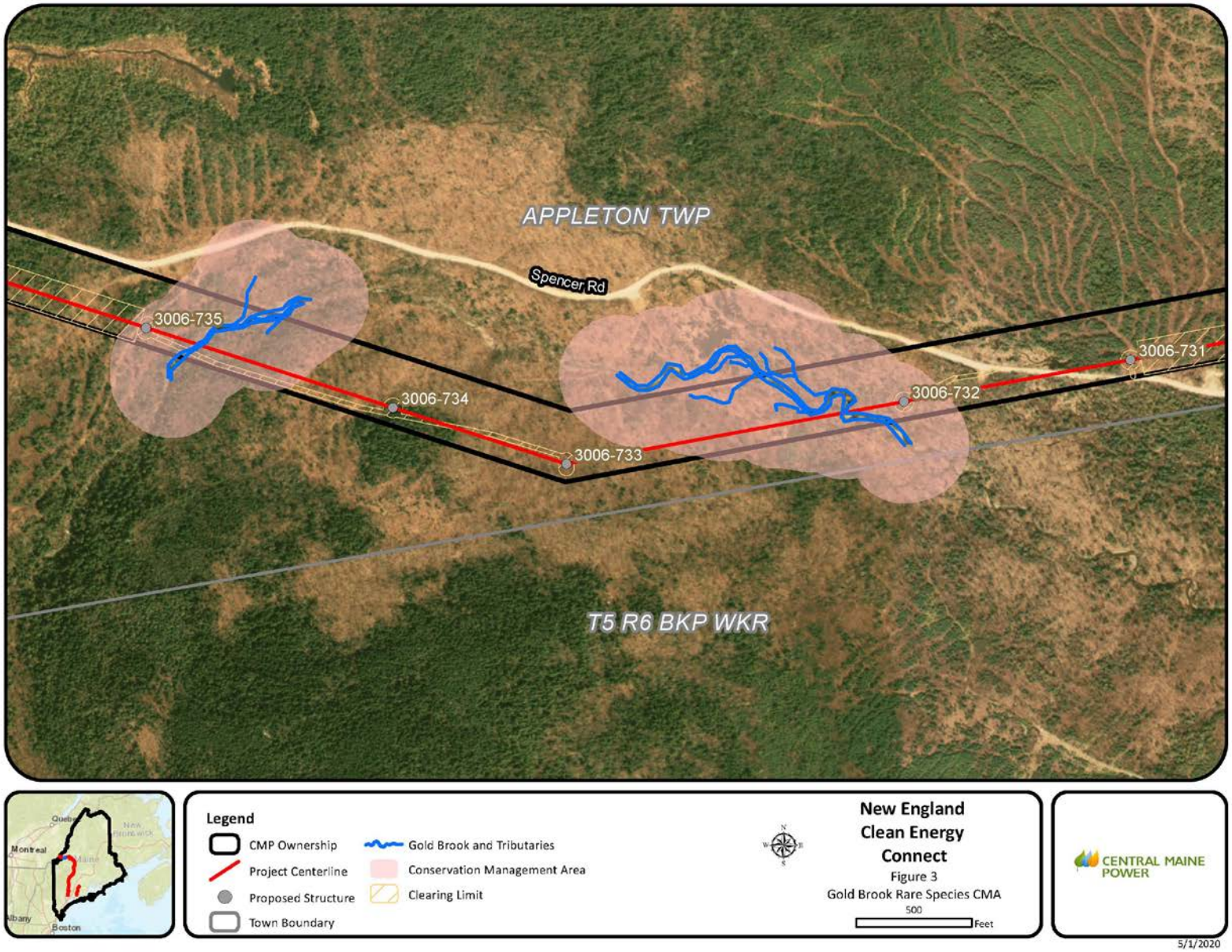
Figure 1

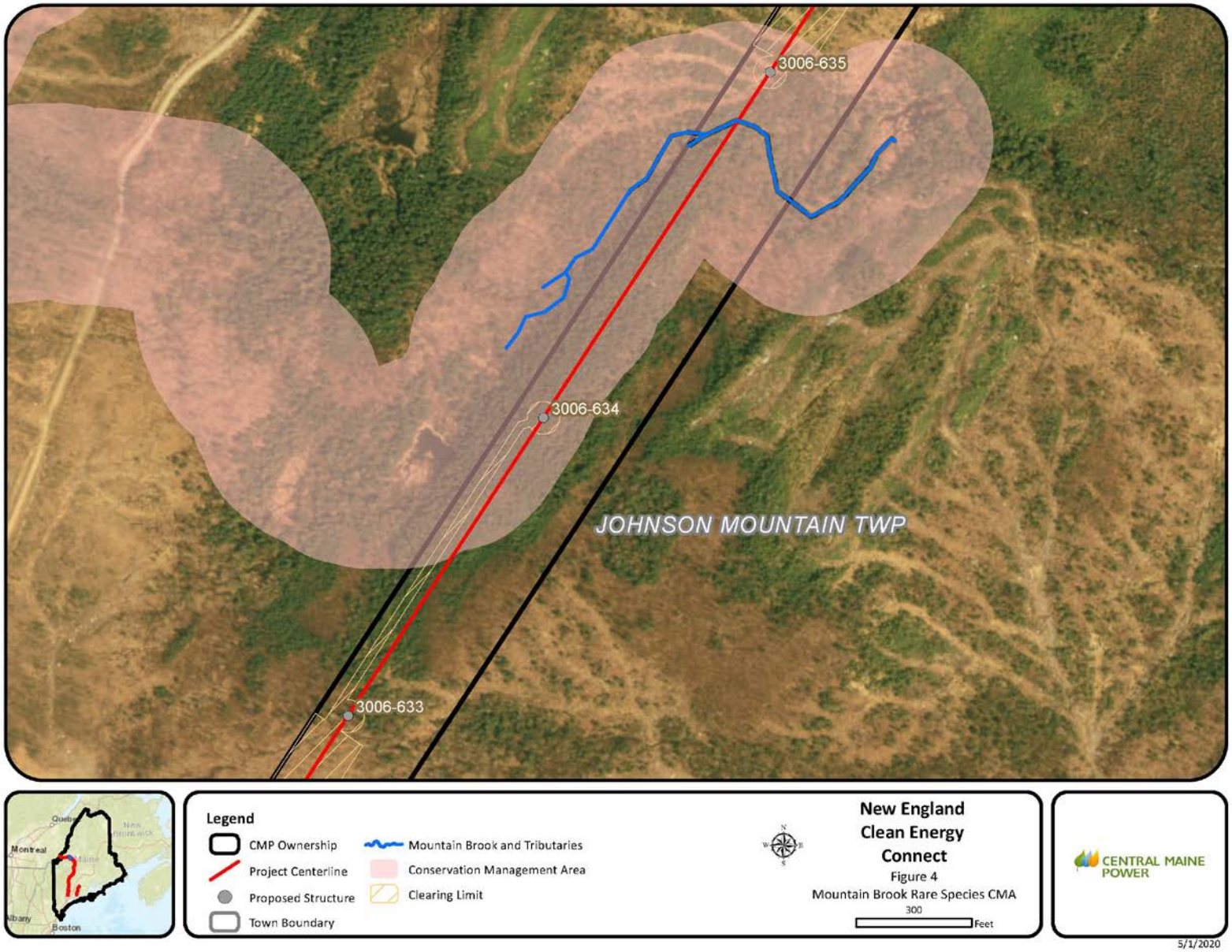


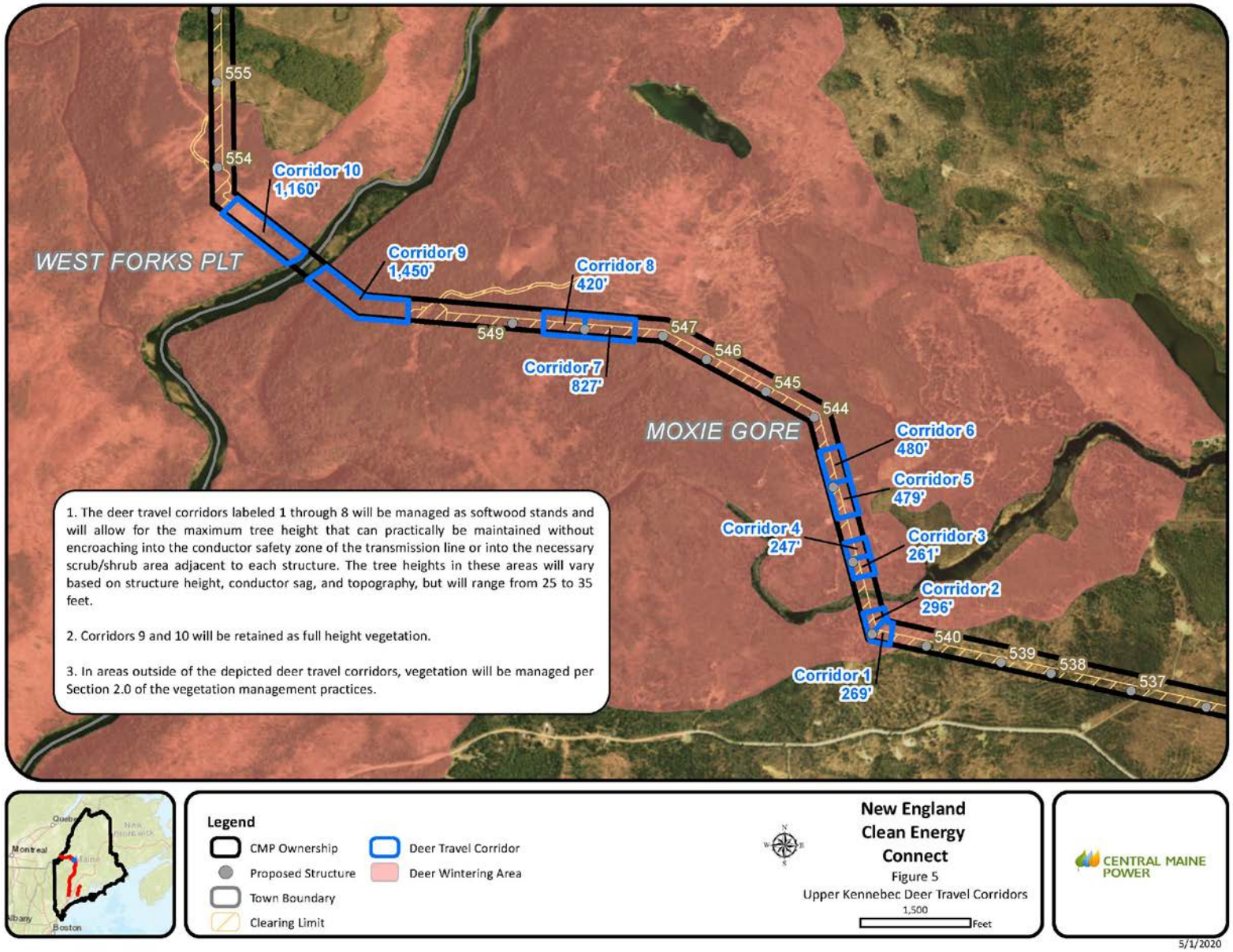
1. With the exception of the vegetation maintenance practices described in Section 2.0 (i.e., full height canopy, minimum 35-foot tall trees, and vegetation tapering requirements in Segment 1) capable species, regardless of height, are cut back to ground level or treated with herbicides within the entire length and width of the transmission line corridor during scheduled vegetation maintenance (every 4 years). However, within stream buffers, only capable specimens over 10 feet tall may be cut or treated (specimens at or above this height are likely to grow into the conductor safety zone prior to the next scheduled vegetation maintenance cycle).
2. All woody vegetation over 10 feet in height and inside the wire zone, whether capable or non-capable, is cut back to ground level during scheduled vegetation maintenance.
3. Vegetation maintenance cycle may not exceed 3 years on Segment 1 without prior approval from MDEP.

Figure 2. Tapered Vegetation Cross Section




APPLETON TWP
Spencer Rd
3006-735
3006-734
3006-733
3006-732
3006-731
T5 R6 BKP WKR
Legend
CMP Ownership
Project Centerline
Proposed Structure
Town Boundary
Gold Brook and Tributaries
Conservation Management Area
Clearing Limit
New England
Clean Energy
Connect
Figure 3
Gold Brook Rare Species CMA
500
Feet
CENTRAL MAINE POWER
5/1/2020


3006-635
3006-634
3006-633
JOHNSON MOUNTAIN TWP
Legend
CMP Ownership
Project Centerline
Proposed Structure
Town Boundary
Mountain Brook and Tributaries
Conservation Management Area
Clearing Limit
New England
Clean Energy
Connect
Figure 4
Mountain Brook Rare Species CMA
300
Feet
CENTRAL MAINE POWER
5/1/2020


555
554
Corridor 10
1,160'
WEST FORKS PLT
Corridor 9
1,450'
Corridor 8
420'
549
547
546
545
544
Corridor 7
827'
MOXIE GORE
Corridor 6
480'
Corridor 5
479'
Corridor 4
247'
Corridor 3
261'
Corridor 2
296'
540
539
538
537
Corridor 1
269'
1. The deer travel corridors labeled 1 through 8 will be managed as softwood stands and will allow for the maximum tree height that can practically be maintained without encroaching into the conductor safety zone of the transmission line or into the necessary scrub/shrub area adjacent to each structure. The tree heights in these areas will vary based on structure height, conductor sag, and topography, but will range from 25 to 35 feet.
2. Corridors 9 and 10 will be retained as full height vegetation.
3. In areas outside of the depicted deer travel corridors, vegetation will be managed per Section 2.0 of the vegetation management practices.
Legend
CMP Ownership
Proposed Structure
Town Boundary
Clearing Limit
Deer Travel Corridor
Deer Wintering Area
New England Clean Energy Connect
Figure 5
Upper Kennebec Deer Travel Corridors
1,500
Feet
CENTRAL MAINE POWER
5/1/2020

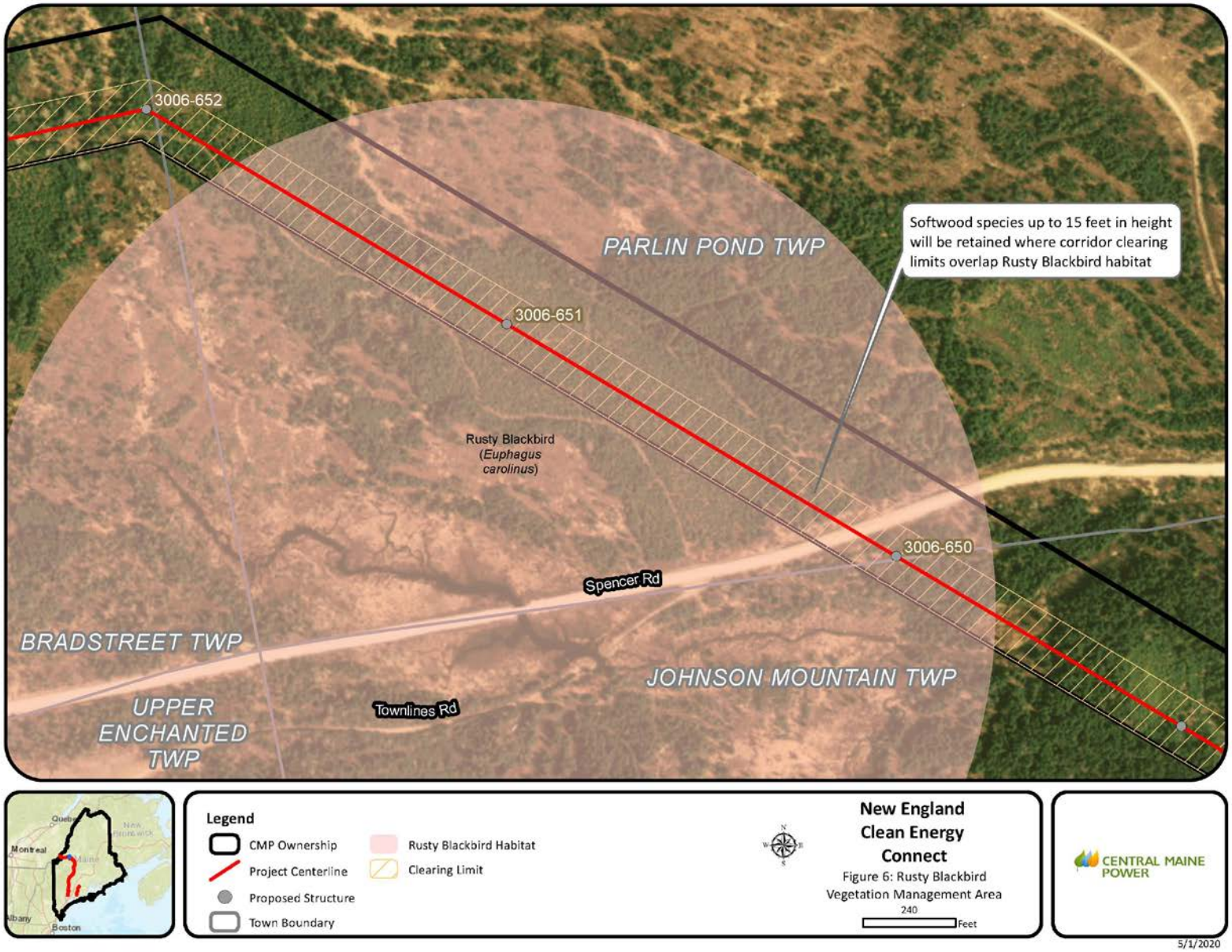

3006-652
3006-651
3006-650
PARLIN POND TWP
Softwood species up to 15 feet in height will be retained where corridor clearing limits overlap Rusty Blackbird habitat
Rusty Blackbird (Euphagus carolinus)
Spencer Rd
BRADSTREET TWP
JOHNSON MOUNTAIN TWP
UPPER ENCHANTED TWP
Townlines Rd
Legend
CMP Ownership
Project Centerline
Proposed Structure
Town Boundary
Rusty Blackbird Habitat
Clearing Limit
New England Clean Energy Connect
Figure 6: Rusty Blackbird Vegetation Management Area
240
Feet
CENTRAL MAINE POWER
5/1/2020

EXHIBIT E: NEW ENGLAND CLEAN ENERGY CONNECT PROJECT DEWATERING PLAN

NECEC Project Construction Dewatering Plan

Construction dewatering may be necessary and may be the best option to manage stormwater or groundwater that enters a construction site on the project. Ground excavations that do not naturally drain to existing grade can trap rain and groundwater and this water must be removed from the site before certain operations can be performed safely. Stormwater and groundwater will be managed by the project with adequate treatment at discharge points to prevent sedimentation of downslope water resources.

Dewatering activities will be conducted in a manner as to:

- Prevent discharge waters from eroding soils or directly entering adjacent water resources
- Remove sediment from the collected water
- Preserve downslope natural resources and adjacent property
- Be located at a site that best achieves the necessary objectives

Considerations

Dewatering locations will be chosen at sufficient distances away from downslope water resources and on a surface that can treat or absorb the discharged waters. A well-vegetated upland buffer with a level or gently sloping terrain will be preferred as these areas provide the best filtration and/or absorption.

All dewatering activities from construction sites will be done in a manner as to not mix with oil, grease or other petroleum-based products, or with other hazardous materials. Contaminated runoff will be contained, treated, discharged or removed in accordance with all local, state, and federal permit conditions and consistent with Maine Erosion and Sediment Control Best Management Practices (BMPs). Dewatering activities will be stopped if project requirements cannot be met, i.e., if the dewatering or discharge site shows signs of erosion or instability, or if turbid water is threatening to enter or is visibly entering adjacent water resources.

Maintenance

All dewatering sites or dewatering structures will be routinely inspected by the contractor and by CMP's environmental inspectors for deficiencies, signs of erosion, or indications that discharge flows may damage the buffer vegetation or degrade the underlying soil. During the dewatering activity, the contractor will be required to continuously monitor discharge water conditions and to ascertain if additional treatment is necessary to effectively remove silt and other pollutants and to prevent erosion or sedimentation of downslope receiving waters.

Specifications

Discharged waters that are visually clear of sediment and turbidity, and have not mixed with other contaminants, will be directly discharged across a generally level, well-vegetated upland buffer, in a manner that promotes sheet flow with low energy. The Project will not discharge waters directly over bare or newly

vegetated soils, and the dewatering process will be stopped if the receiving area shows signs of instability or erosion, or if downslope waters shows signs of sedimentation or turbidity.

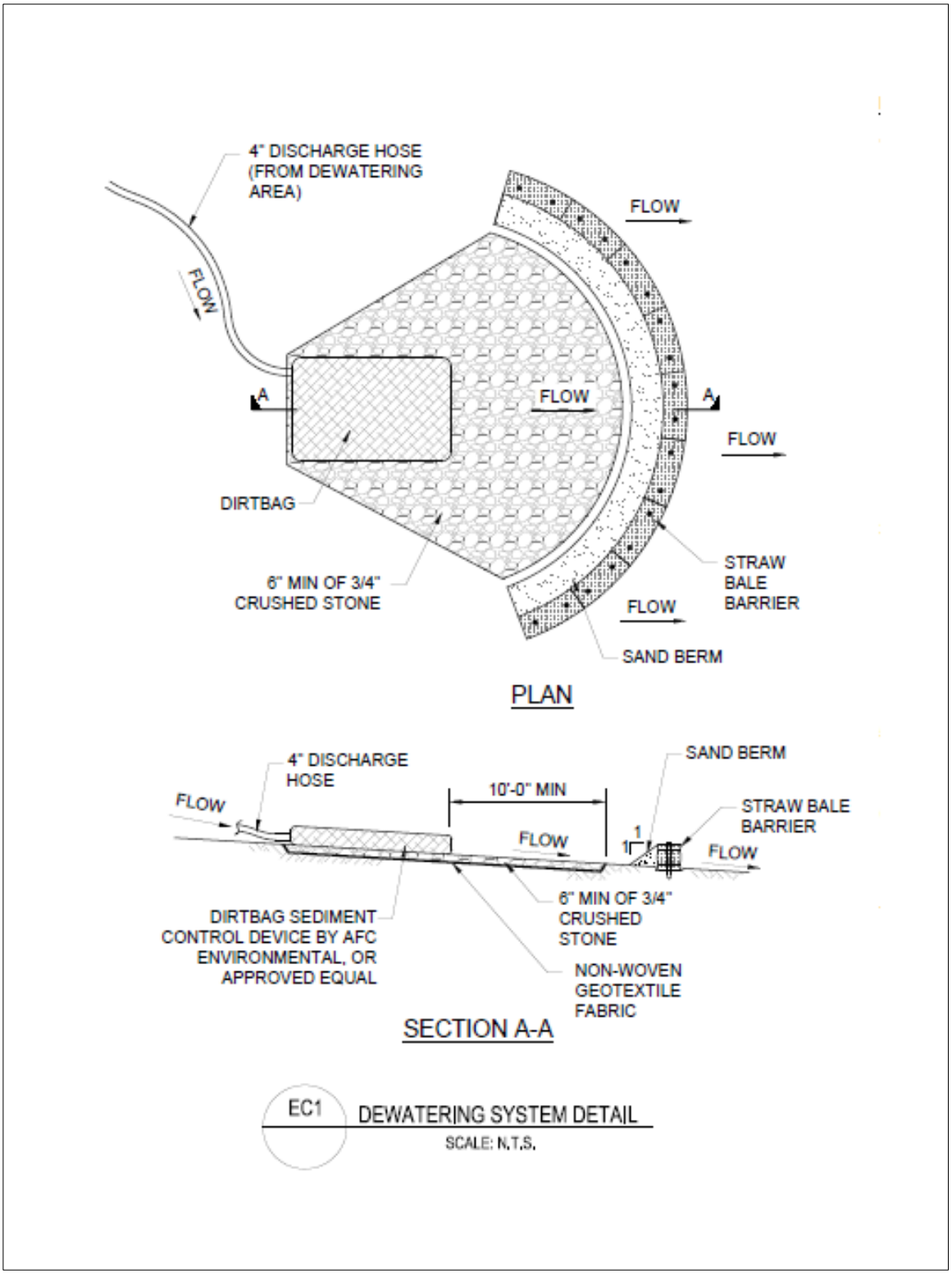
The following techniques will be considered based on the site conditions and to best facilitate the water removal process:

- Installation of diversion ditches or berms to minimize or prevent offsite stormwater runoff from entering the excavated area.
- Excavations and disturbance areas will be limited to only what is necessary for the current task and the excavated material will be placed on the upslope side of the work site.
- The water removal process may include, but may not limited to, drainage through stabilized channels, mechanical pumping, siphoning or use of a bucket from construction equipment.
- All channels, swales and ditches used for discharge will be adequately stabilized so that flow velocities do not cause erosion and instability. Stone lining or check dams are options for channel stabilization and energy dissipation.
- Dewatering activities will be avoided during forecasted heavy rain events to the extent practicable.

To best facilitate the sediment removal process, the following options may be used as standalone techniques or in combination, and will be considered and implemented as appropriate based on site-specific conditions:

- Use of a fabric bag (silt sack or dirt bag) to filter pumped water to be located within or near a vegetated upland buffer or natural depression, or within a temporary basin or sediment trap, generally constructed in the shape of a corral (either earth material, haybales, or erosion control mix berms) with silt fence and or geotextile fabric lining. See Figure 1.
- An excavated pit or settling pond for dewatering discharge may be dug where site conditions allow.
- Portable storage tanks may be brought onsite to store and treat larger volumes of water that require longer settling periods.
- If water quality/treatment objectives cannot be achieved with various dewatering methods, onsite discharge will not occur and off-site disposal via a pump truck may be necessary. Approval of the off-site disposal location will be required by CMP.

Figure 1. Typical Dewatering System



Note: Alternatives to the crushed stone underlayment include well vegetated surfaces and erosion control mulch. Straw bale barriers may be replaced by silt fence, erosion control mulch, or a combination thereof. Sand berms and geotextile fabric may be used as necessary to prevent turbid discharges to receiving waters.

EXHIBIT F: REQUIREMENTS FOR INADVERTENT FLUID RELEASE PREVENTION, MONITORING, AND CONTINGENCY PLAN FOR HDD OPERATION

REQUIREMENTS FOR INADVERTENT FLUID RELEASE PREVENTION, MONITORING, AND CONTINGENCY PLAN FOR HDD OPERATIONS

Prepared for the

CENTRAL MAINE POWER COMPANY
NEW ENGLAND CLEAN ENERGY CONNECT
KENNEBEC RIVER CROSSING

Location

West Forks Plantation &
Moxie Gore,
Maine 04985

Owner

Central Maine Power Company
83 Edison Drive
Augusta, Maine 04336

Prepared by

6 Ashley Drive
Scarborough, ME 04074
(207) 274-2631
October 2018

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Requirements for Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan for HDD Operations

This document lists the minimum requirements for a site-specific inadvertent fluid release plan that shall be prepared by the Horizontal Directional Drilling (HDD) Contractor selected for this project. The purpose of this plan is to prevent any inadvertent fluid releases, to quickly identify any inadvertent fluid releases that do occur, and to contain, minimize, and remediate any environmental impacts associated with any release of HDD drilling fluids.

The final inadvertent fluid release pprevention, mmonitoring, and contingency plan will be provided to the Owner, and relevant regulatory agencies before the commencement of drilling activities.

1 PROJECT SUMMARY

Avangrid – Central Maine Power Company (CMP) (Owner) intends to contract for HDD services for the NECEC Kennebec River Crossing project.

This project generally consists of installation of a HVDC electric power transmission line under the Kennebec River in the area of Moxie Gorge. This section of the Kennebec River is designated as an Outstanding River Segment and requires measures to prevent and minimize environmental impacts. As part of this project the Owner requires development of an inadvertent fluid release prevention, monitoring, and contingency plan (Plan) and implementation of the plan during all HDD operations for the Kennebec River Crossing.

The HDD drill site will be on the east side of the river at the Moxie Gore termination station and the receiving site is on the west of the river at the West Forks termination station. There is a vertical drop of more than 300 feet from the termination stations to the river valley and the HDD is approximately 3,000 feet in horizontal length.

2 PLAN SUBMITTAL REQUIREMENTS

The Contractor shall submit for Owner approval a Plan that includes the address of the regulatory agencies and the 1-800 spill hotline number for reporting releases of drilling fluids into water resources, a description of the means, methods, materials and equipment the Contractor will use prior to, during and after the HDD operations required for this project. The Contractor shall revise and resubmit the Plan if site conditions warrant any changes. Written approval of the Plan by the Maine Department of Environmental Protection and the Owner shall be obtained prior to the start of work.

3 RELEASE PREVENTION

The Contractor is responsible for the engineering design of the HDD for this project and this Inadvertent Fluid Release Plan shall be prepared in conjunction with their detailed design.

This plan shall document preventative measured incorporated into the design. This includes but is not limited to measures such as:

- Subsurface and geotechnical investigations that were performed.
- Engineering standards employed.
- Design assumptions used.
- Calculations made to estimate soil/bedrock fracturing under planned fluid pressures.
- HDD alignment changes required (increased depth, poor soil avoidance, etc.) based on site conditions.
- Design features used for this project that were used successfully on similar projects or that are used to remedy prior problems.
- Drilling fluid composition for anticipated soil conditions.

4 DRILLING FLUID

The Contractor's Plan shall discuss the purpose and use of drilling fluids in HDD operations, including, but is not limited to:

- A description of how the drilling fluids remove cuttings and spoils from the bore hole, lubricate and cool the drill head and keep the bore hole from collapsing.
- A description of mud motors and how the drilling fluids are pumped through the drill steel and out of the drill head.
- A description of how the high-pressure fluid used during drilling creates a chance of an inadvertent release of drilling fluids due to weak spots/seams in the overlying soils that cannot contain the fluid pressure and allows migration of the fluids to the surface.
- A description of the chemical composition and characteristics of drilling fluid and any/all additives. Drilling fluid is comprised of water and naturally occurring clay called sodium montmorillonite (bentonite). Bentonite is a non-toxic, non-reactive, inert material that allows the HDD Contractor to monitor and adjust the viscosity of the drilling fluid to achieve the desired carrying and lubricating properties.
- Documentation that the drilling fluid composition complies with all Federal, State, and local environmental regulations.
- Documentation that no contamination is introduced into the soil during the drilling, reaming, or conduit installation processes.

4.1 Additives

The Plan will include how and why additives are used in the drilling fluid to adjust the viscosity, improve hole integrity, prevent, or reduce fluid release, and how adjustments to the drilling fluid characteristics are made during the drilling operations. The Plan will describe the names and chemical compositions of additives proposed for this project including clays, organic fibers, modified starches and non-reactive polymers. Petroleum-based additives shall not be used. Safety Data Sheets for all additives used will also be included in the Plan.

Additives that are not listed in the approved Plan shall not be used.

4.2 Disposal

The Plan shall describe drilling fluid and spoils collection, segregation, transportation and disposal. Recycling and reuse of drilling fluids shall be used to limit disposal quantities. Prior to drilling operations, the HDD contractor shall identify one or more licensed landfills or off-site facilities for disposal of the cuttings, spoils and excess drilling fluid, and shall include the names and licenses of these facilities in this Plan.

The HDD contractor will dispose of all fluids in a manner that is in compliance with all permits and applicable Federal, State, and local regulations.

5 DESIGN CONSIDERATIONS

The Owner and its Consultants will undertake several steps during design to minimize the occurrence of an inadvertent release of drilling fluid.

5.1 Identify Soil and Subsurface Conditions

The Owner and its Consultants will undertake geotechnical investigations to identify the materials being drilled through, resistance to drilling operations, and resistance to fluid migration. The Owner will provide the geotechnical report to the Contractor for their use in designing the HDD for this project.

5.2 Drill Design

The Contractor shall prepare detailed design calculations and plans identifying the drill path, expected spoils volumes, pipe installation stresses and fluid pressures.

5.3 Additional Modeling for Kennebec River Crossing

For the HDD crossing of the Kennebec River, the drilling fluid will need to circulate at a high pressure. The Contractor shall perform site-specific modeling to estimate the ability of the overlying soils to withstand fluid migration (Hydrofracture Modeling). These models shall be

used in conjunction with the expected fluid pressures to determine the appropriate installation depth.

5.4 Drill Fluid Return Estimates

The Plan shall describe how a complete recovery of all circulating drilling fluids is not expected due to naturally occurring voids and low-density areas within the soil which will be filled by the fluids immediately adjacent to the borehole during the drilling process. The plan shall estimate typical expected fluid return volumes along the borehole alignment during all the HDD phases, including pilot hole, 1st reaming, 2nd reaming etc. so that abnormal/low fluid returns can be monitored and evaluated/investigated.

6 MONITORING AND ACTION PLAN

The Plan shall include the Contractors monitoring of HDD activities along the drilling path and downstream of the drilling path, including on the river, and the Contractors actions required for various site conditions. The Plan shall describe how HDD operations will be coordinated/scheduled with the Harris Hydropower Dam owner (Brookfield Renewables) to facilitate inadvertent fluid release monitoring during periods of low river flow. The Monitoring and Action Plan shall include but is not limited to the following:

Table 5-1:

Drilling Fluid Monitoring and Action Plan Summary		
Condition	Status	Actions
Condition 1: Normal Drilling Conditions	Normal drilling fluid circulation is	• Perform routine collection of drilling fluid at endpoints • Perform routine drilling data collection

Drilling Fluid Monitoring and Action Plan Summary		
Condition	Status	Actions
	maintained	• Conduct routine visual monitoring for surface releases along drill path
Condition 2: Loss or Reduction of Circulation	Loss or significant reduction of fluid circulation	• Notify Owner • Adjust drilling parameters to regain circulation • Increase visual monitoring for surface release • Continue drilling if no release is detected
Condition 3: Drilling Fluid Release and Remediation	Drilling fluid release is confirmed	• Notify Owner • Monitor and document release area • Contain and collect release if feasible • Suspend HDD operations if containment is not feasible

6.1 Condition 1: Normal Drilling Conditions

The HDD Contractor shall maximize recirculation of drilling fluid surface returns and provide solids control and fluid cleaning equipment of a configuration and capacity that can process surface returns and produce drilling fluid suitable for reuse.

The Contractor shall at all times provide and maintain instrumentation which accurately locates the pilot hole, measures drill string axial and torsional loads, and measures the drilling fluid discharge rate and pressure.

The Owner and authorized regulatory agency representatives shall have access to these instruments and their readings upon request. A log of all recorded readings shall be maintained by the Contractor at the drill rig site and shall become part of the construction record.

Routine visual monitoring under Condition 1 shall consist of periodic visual examination by the HDD Contractor personnel along the drilled alignment. Due to the land cover and terrain at the Kennebec River crossing these visual inspections will be made on foot.

These examinations shall be made periodically on a time interval not to exceed one hour. The name of the inspector, time of the examination, and observations shall be kept in a log at the drill rig site and shall be available for inspection.

6.2 Condition 2: Loss or Reduction of Circulation

Condition 2 actions shall be implemented if the drilling fluid fails to circulate as expected. Drilling fluid circulation shall be evaluated on the basis of comparing actual quantities against the planned quantities for the volume of fluid being recovered, drilling fluid pressures, and location of fluid recovered.

The Contractor shall continuously compare estimated fluid returns with measured returns to monitor for drilling fluid loss and inadvertent fluid release. The following minimum actions shall be implemented if a loss or significant reduction of drilling fluid circulation occurs.

6.2.1 HDD Contractor will notify the Owner who may notify regulatory agency representatives that drilling is continuing under Condition 2.

6.2.2 The Contractor shall increase monitoring frequency from Routine to Focused monitoring. Focused monitoring consists of continuous monitoring of the drill alignment by personnel with no other duties. Sufficient personnel will be used to ensure that each portion of the alignment is inspected at least once every 30 minutes.

6.2.3 HDD Contractor shall immediately take steps to restore circulation. These steps shall include, but are not be limited to:

- Size the hole. Sizing (Swabbing) involves withdrawing the drill string to mechanically clean the drilled hole.

- Adjust drilling fluid viscosity and gelling properties to encourage annular flow and stabilize the entire structure.

6.2.4 The HDD Contractor shall consider the following adjustments in addition to the above steps.

- Adding additional pre-approved filling or stabilizing materials to potentially seal fissures in the soil.
- Adjust the drill cutting heads and speeds for potential soil pockets.

Once circulation is restored, drilling shall continue under Condition 2 for a period of not less than eight (8) drilling hours. If a release is not identified, and loss or significant reduction of drilling fluid circulation does not re-occur, the HDD Contractor shall notify the Owner, who may notify regulatory agency representatives that drilling under Condition 1 has resumed.

The HDD Contractor will keep the Owner notified about changes to circulation status, including if circulation has been restored or partially restored. The Owner may notify regulatory agency representatives about these changes.

6.3 Condition 3: Drilling Fluid Release, Containment and Remediation

This section covers the general principles for Condition 3 and drilling fluid containment. More detailed requirements for containment and equipment are included in Section 6 of this plan. If a drilling fluid release is detected the Contractor shall at a minimum take the following immediate actions.

6.3.1 The HDD Contractor shall immediately notify the Owner that a fluid release has been detected. The Owner will notify regulatory agency representatives as soon as possible, however no later than 24 hours after a fluid release has been detected.

6.3.2 HDD Contractor shall immediately begin containment efforts. See Section 6 for discussion of containment methods and equipment requirements.

6.3.3 The Contractor shall take steps to reduce released fluid volumes and pressures that include but are not limited to:

- Size and swab the bore hole
- Adjust drilling fluid viscosity and gel properties to restore circulation
- Add additional pre-approved filling or stabilizing materials to potentially seal fissures in the soil.

6.3.4 Once containment has been established HDD drilling will continue under Condition 3. If the amount of the release occurring exceeds that which can be contained and collected, drilling operations will be suspended until released volumes can be properly contained.

6.3.5 The Contractor shall continue Focused Monitoring, as discussed in section 5.2.2, as well as downstream of the drilling alignment, to ensure additional fluid releases have not occurred.

6.3.6 All measures necessary will be undertaken to prevent release of drilling fluid to the Kennebec River.

If the amount of any drilling fluid release, either on land or within the waters, exceeds that which can be feasibly contained and collected, drilling operations will be suspended and the HDD Contractor shall notify the Owner, who will notify regulatory agency representatives that drilling cannot continue until effective fluid containment measures are developed and implemented without a continuous release of drilling fluid. Drilling will not resume until the Owner and regulatory agencies have approved a plan for continuing with limited releases or recovering drilling equipment and halting drilling activities.

Drilling fluid returns may stop as the drilling fluid consistency changes. If drilling fluid stops returning the surface containment measures shall be maintained in place and drilling will continue under Condition 2.

The HDD Contractor shall keep the Owner and regulatory agency representatives notified when fluid circulation has been restored, as well as the status of any additional releases and their containment.

7 CONTAINMENT METHODS AND EQUIPMENT

The Contractors Plan shall describe containment methods and equipment required based on the potential locations of the release and potential volume of fluid.

The Plan shall describe in detail site specific containment methods, equipment requirements, equipment staging, communication responsibilities, contractors' personnel training and staffing during a release incident. The equipment required to response to an inadvertent fluid release shall be on site, accessible and ready for deployment during all drilling activities.

7.1 Kennebec River Crossing, In Water

The Plan shall describe river low-flow and high-flow conditions and how release monitoring will be coordinated with and shall occur during low river flow conditions. The Plan will document the communication process such as chain of command, responsible parties, and reporting and remediation time frames.

The Plan shall describe how drilling fluid is heavier than water and is typically released at low velocities and settles in low areas. The Plan shall 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 released 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 Contractors Plan shall describe containment material and equipment staging near the river bank above high water levels. This list of additional containment materials should include barriers, sump pumps, power sources, and hoses and containment tanks that will be staged at the HDD entry or exit points within 1,000 feet of the river.

Specific barriers and equipment shall be identified by the HDD Contractor for the Kennebec River crossing.

7.2 Kennebec River Crossing, On Land

The Plan shall describe spill prevention materials for the HDD entry and exit points.

The HDD Contractor shall discuss how a fluid release containment sump will be constructed on land in soil areas and in shallow bedrock areas, and describe how contained fluids are managed, transported and disposed of.

Any fluid released before a containment can be established shall be contained with temporary barriers such as sand bags, silt fence or filter bags, and then swept back into the containment sump or contained in low areas and vacuumed into holding tanks.

Specific barriers and equipment shall be identified by the HDD Contractor in this Plan.

8 REMEDIATION

The Contractor shall develop and provide a site specific plan for remediation of fluid releases in water and on land to the Owner and regulatory agencies for their review and approval, as part of this Plan, before commencement of drilling activities.

If a fluid release occurs, the HDD Contractor shall contain all fluids, remove drilling fluid that can be vacuumed or swept up, and shall restore the release site.

8.1 Kennebec River Crossing, In Water

The Plan shall discuss removal of drilling fluid from the collection sump and the level of remediation that will be achieved. The Plan will document the communication process and remediation efforts with ample documentation for the Owner and regulatory agencies. The Owner and/or regulatory agencies shall observe the Contractors remediation activities.

After the sump and containment have been remediated and removed the Contractor shall inspect the riverbed a minimum of 500 feet downstream from the fluid release site looking for pockets of

slower moving water where drilling fluid may have collected. Any pockets located shall be evaluated to determine if drilling fluid is present and, if so, whether and how it can be removed.

8.2 Kennebec River Crossing, On Land

On land the drilling fluid shall be collected into a sump and removed by pumping or vacuuming. Repeated flushes with clean potable water shall be used to remove drilling fluid from vegetation. The Plan will outline the procedures necessary for stabilizing and restoring all disturbed areas to pre-existing conditions.

EXHIBIT G: ATLANTIC SALMON WATERBODY TABLE

Footnotes for the NECEC Atlantic Salmon Waterbody Table (Exhibit G)

General Notes: Information presented in the Atlantic Salmon Waterbody Table is based on data collected in the field, input from agency representatives during consultation, USGS National Hydrography dataset and ESRI ArcGIS mapping services.

1. Stream names are based on the USGS National Hydrography dataset. Tributary names were assigned based on review of watershed areas and drainage patterns.

2. Waterbody crossings widths were based on field data collected in 2015, 2016 and 2017.

3. Stream types: Perennial (PER) or Intermittent (INT). Open Water (Open Water). Stream types were based on field data collected in 2015, 2016 and 2017.

4. State of Maine Water Quality Classifications
   Source: The Bureaus of Land Resources and Water Quality- Waterbody Statutory Classification dataset http://www.maine.gov/dep/gis/datamaps/

   Class

   AA Class AA shall be the highest classification and shall be applied to waters which are outstanding natural resources and which should be preserved because of their ecological, social, scenic, or recreational importance. Class AA waters shall be of such quality that they are suitable for the designated uses of drinking water after disinfection, fishing, recreation in and on the water and navigation and as habitat for fish and other aquatic life. The habitat shall be characterized as free flowing and natural.

   A Class A waters shall be of such quality that they are suitable for the designated uses of drinking water after disinfection; fishing; recreation in or on the water; industrial power generation, except as prohibited under Title 12, section 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as natural.

   B Class B waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial processes and cooling water supply; 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as unimpaired.

   C Class C waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as a habitat for fish and other aquatic life.

   GPA Class GPA shall be the sole classification of great ponds and natural ponds and lakes less than 10 acres in size. Class GPA waters shall be of such quality that they are suitable for the designated uses of drinking water after disinfection, recreation in and on the water, fishing, industrial process and cooling water supply, hydroelectric power generation and navigation, and as habitat for fish and other aquatic life. The habitat shall be characterized as natural.

   N/A or "Not Available" indicates that a classification for this waterbody was not available from the referenced source.

5. Source: Cushing, E. Atlantic Salmon: Critical Habitat dataset. 1994. National Oceanic Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). http://www.nmfs.noaa.gov/gis/data/critical.htm#ne. Accessed May 16, 2017.

a. This dataset represents the geographic area containing the Gulf of Maine distinct population segment of Atlantic salmon as designated by *Federal Register* Vol. 74, page 29300, June 19, 2009.
b. This dataset represents critical habitat for the Gulf of Maine distinct population segment of Atlantic salmon as designated by *Federal Register* Vol. 74, page 29300, June 19, 2009.

6. Buffer widths of 100 feet were determined using the following criteria: presence of RTE species including all streams within the Atlantic Salmon Gulf of Maine Distinct Population Segment which includes the critical habitat, presence of Brook Trout Habitat, designation of an Outstanding River Segment, and all perennial streams on Segment 1 (greenfield) of the NECEC. Streams that do not meet these criteria have a buffer width of 75 feet. Buffers and permitted activities further described in Exhibit C and Exhibit D of the Biological Assessment.

7. Linear feet of stream which intersects with the project corridor or CMP's controlled land.

8. Linear feet of stream which will be impacted by permanent forest conversion.

9. Where temporary equipment crossings are proposed, no in-stream work will take place. The bridges will be designed to span the entire width to avoid in-stream work.

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
1	Appleton Twp	E	ISTR-15-05	Trib. to Gold Brook	2	INT	N/A	Y	N	Y	85	0	0	N	35
1	Appleton Twp	E	ISTR-15-07	Gold Brook	15	INT	A	Y	N	Y	447	80	0	N	36
1	Appleton Twp	E	ISTR-15-09	Trib. to Gold Brook	2	INT	A	Y	N	Y	524	85	0	N	36
1	Appleton Twp	E	ISTR-15-10	Trib. to Gold Brook	3	INT	N/A	Y	N	Y	251	317	21	Y	36
1	Appleton Twp	E	ISTR-15-12	Trib. to Gold Brook	2	INT	N/A	Y	N	Y	270	88	0	N	36
1	Appleton Twp	E	ISTR-16-01	Trib. to Baker Stream	25	INT	N/A	Y	N	Y	289	17	0	N	38, 39
1	Appleton Twp	E	ISTR-16-04	Trib. to Gold Brook	4	INT	A	Y	N	Y	612	330	0	N	37
1	Appleton Twp	E	ISTR-16-05	Trib. to Gold Brook	4	INT	A	Y	N	Y	419	175	0	N	37
1	Appleton Twp	E	ISTR-16-16	Trib. to Gold Brook	2	INT	A	Y	N	Y	232	34	0	N	37
1	Appleton Twp	E	ISTR-17-02	Trib. to Baker Stream	3	INT	N/A	Y	N	Y	142	615	325	Y	39
1	Appleton Twp	E	ISTR-17-04	Trib. To Rock Pond	2	INT	N/A	Y	N	Y	355	38	38	N	40
1	Appleton Twp	E	ISTR-17R-05	Trib. To Rock Pond	2	INT	N/A	Y	N	Y	484	2	2	N	40
1	T5 R7 BKP WKR	E	ISTR-18-01		1	INT	N/A	Y	N	Y	359	87	87	N	42,43
1	T5 R7 BKP WKR	E	ISTR-18-02		2	INT	N/A	Y	N	Y	361	343	184	Y	42,43
1	T5 R7 BKP WKR	E	ISTR-18-08	Trib. to Fish Pond	3	INT	N/A	Y	N	Y	392	273	90	N	41, 42
1	T5 R7 BKP WKR	E	ISTR-18-10		4	INT	A	Y	N	Y	531	267	151	Y	42
1	T5 R7 BKP WKR/Hobbstown Twp	E	ISTR-18-11	Trib. to Fish Pond	3	INT	N/A	Y	N	Y	402	166	128	Y	42
1	T5 R7 BKP WKR	E	ISTR-18-16	Trib. to Fish Pond	4	INT	A	Y	N	Y	252	99	99	N	41
1	Johnson Mountain Twp	E	ISTR-33-02	Trib. to MountainBrook	1.5	INT	N/A	Y	N	Y	200	93	80	N	76
1	Johnson Mountain Twp	E	ISTR-35-02	Trib. to Salmon Stream	2	INT	A	Y	N	Y	178	284	48	N	80
1	Johnson Mountain Twp	E	ISTR-36-01	Trib. to Salmon Stream	2	INT	N/A	Y	N	Y	425	199	152	N	83
1	Johnson Mountain Twp	E	ISTR-36-02	Trib. to Salmon Stream	2.5	INT	A	Y	N	Y	220	353	171	Y	82, 83
1	Johnson Mountain Twp	E	ISTR-36-04	Trib. to Salmon Stream	2	INT	N/A	Y	N	Y	452	99	0	N	83
1	Johnson Mountain Twp	E	ISTR-36-05	Trib. to Salmon Stream	1.5	INT	N/A	Y	N	Y	317	152	0	N	83
1	Johnson Mountain Twp	E	ISTR-37-01	Trib. to East Branch Salmon Stream	2.5	INT	N/A	Y	N	Y	169	144	0	N	84

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	E	ISTR-38-01	Trib. to East Branch Salmon Stream	2	INT	N/A	Y	N	Y	193	355	180	N	87
1	Johnson Mountain Twp	E	ISTR-38-03	Trib. to East Branch Salmon Stream	3	INT	N/A	Y	N	Y	510	225	53	N	87
1	Johnson Mountain Twp	E	ISTR-38-05	Trib. to East Branch Salmon Stream	4	INT	A	Y	N	Y	153	253	207	Y	86, 87
1	Johnson Mountain Twp	E	ISTR-38-07	East Branch Salmon Stream	3	INT	A	Y	N	Y	206	321	127	N	86, 87
1	Johnson Mountain Twp	E	ISTR-38-08	Trib. to East Branch Salmon Stream	2	INT	N/A	Y	N	Y	75	240	22	N	86
1	Johnson Mountain Twp	E	ISTR-38-11	Trib. to East Branch Salmon Stream	1.5	INT	A	Y	N	Y	137	201	10	N	85, 86
1	Johnson Mountain Twp	E	ISTR-38-12	Trib. to East Branch Salmon Stream	2	INT	A	Y	N	Y	149	155	113	N	85, 86
1	Johnson Mountain Twp	E	ISTR-38-13	Trib. to East Branch Salmon Stream	1.5	INT	N/A	Y	N	Y	237	106	0	N	85, 86
1	Johnson Mountain Twp	E	ISTR-38-14	Trib. to East Branch Salmon Stream	1.5	INT	A	Y	N	Y	159	107	107	N	85, 86
1	Johnson Mountain Twp	E	ISTR-39-01	Trib. to Cold Stream	4	INT	N/A	Y	N	Y	232	531	346	Y	89
1	Johnson Mountain Twp	E	ISTR-39-03	Trib. to East Branch Salmon Stream	4	INT	N/A	Y	N	Y	291	276	276	N	88
1	Johnson Mountain Twp	E	ISTR-41-02	Trib. to Tomhegan Stream	1	INT	N/A	Y	N	Y	322	317	159	Y	94
1	Johnson Mountain Twp	E	ISTR-41-04	Trib. to Cold Stream	2	INT	N/A	Y	N	Y	103	49	21	N	92, 93
1	Johnson Mountain Twp	E	ISTR-41-05	Trib. to Cold Stream	4	INT	N/A	Y	N	Y	448	240	82	N	93
1	Johnson Mountain Twp	E	ISTR-42-02	Trib. to Tomhegan Stream	4	INT	N/A	Y	N	Y	217	29	0	N	96
1	Johnson Mountain Twp	E	ISTR-42-07	Trib. to Tomhegan Stream	5	INT	N/A	Y	N	Y	171	194	27	N	94
1	Johnson Mountain Twp	E	ISTR-42-08	Trib. to Tomhegan Stream	3	INT	N/A	Y	N	Y	210	36	0	N	94
1	Johnson Mountain Twp	E	ISTR-42-09	Trib. to Tomhegan Stream	5	INT	N/A	Y	N	Y	159	135	105	N	94
1	Johnson Mountain Twp	E	ISTR-42-10	Trib. to Tomhegan Stream	2	INT	N/A	Y	N	Y	135	169	169	Y	94
1	Johnson Mountain Twp	E	ISTR-42-13	Trib. To Little Wilson Hill Pond	4	INT	N/A	Y	N	Y	374	176	176	Y	94, 95
1	West Forks Plt	D	ISTR-44-08	Tomhegan Stream	3	INT	A	Y	N	Y	345	44	44	Y	100
1	West Forks Plt	D	ISTR-45-02	Trib. to Tomhegan Stream	4	INT	N/A	Y	N	Y	428	54	0	N	100
1	West Forks Plt	D	ISTR-45-02-02	Trib. to Tomhegan Stream	3	INT	N/A	Y	N	Y	457	16	0	N	100
1	West Forks Plt	D	ISTR-45-04	Trib. to Tomhegan Stream	3	INT	N/A	Y	N	Y	309	142	142	N	100, 101
1	West Forks Plt	D	ISTR-46-05	Trib. to Cold Stream	4	INT	N/A	Y	N	Y	136	51	51	N	103

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
1	Moxie Gore	D	ISTR-49-01	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	360	147	101	N	111
1	Moxie Gore	D	ISTR-50-02	Trib. to Moxie Stream	1.5	INT	N/A	Y	N	Y	21	179	179	N	113
1	Moxie Gore	D	ISTR-51-01	Trib. to Moxie Stream	80	INT	N/A	Y	N	Y	325	303	149	Y	113
1	Moxie Gore	D	ISTR-51-02	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	279	55	55	N	113
1	Moxie Gore	D	ISTR-51-03	Trib. to Moxie Stream	4	INT	N/A	Y	N	Y	293	50	50	N	113
1	Moxie Gore	D	ISTR-51-04	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	325	38	38	N	113
1	Moxie Gore	D	ISTR-51-05	Trib. to Moxie Stream	8	INT	N/A	Y	N	Y	361	21	21	N	113
1	Moxie Gore	D	ISTR-51-06	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	380	29	29	N	113, 114
1	Moxie Gore	D	ISTR-51-07	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	416	106	0	N	114
1	Moxie Gore	D	ISTR-51-08	Trib. to Moxie Stream	1.5	INT	N/A	Y	N	Y	230	237	68	N	114, 115
1	Moxie Gore	D	ISTR-51-09	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	242	192	17	N	114, 115
1	Moxie Gore	D	ISTR-51-10	Trib. to Moxie Stream	6	INT	N/A	Y	N	Y	264	21	0	N	114, 115
1	Moxie Gore	D	ISTR-51-11	Trib. to Moxie Stream	4	INT	N/A	Y	N	Y	270	95	0	N	114, 115
1	Moxie Gore	D	ISTR-51-12	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	488	20	0	N	115
1	Moxie Gore	D	ISTR-51-13	Trib. to Moxie Stream	6	INT	N/A	Y	N	Y	403	265	157	Y	115
1	Moxie Gore	D	ISTR-51-14	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	58	196	168	Y	115
1	Moxie Gore	D	ISTR-51-15	Trib. to Moxie Stream	1.5	INT	N/A	Y	N	Y	334	48	48	Y	115
1	Moxie Gore	D	ISTR-51-16	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	297	75	75	N	115
1	Moxie Gore	D	ISTR-51-17	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	236	178	105	N	115
1	Moxie Gore	D	ISTR-51-18	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	221	26	26	N	115
1	Moxie Gore	D	ISTR-51-19	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	242	105	36	N	115
1	Moxie Gore	D	ISTR-51-20	Trib. to Moxie Stream	1.5	INT	N/A	Y	N	Y	236	141	141	Y	115
1	Moxie Gore	D	ISTR-51-21	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	389	20	0	N	115
1	Moxie Gore	D	ISTR-52-01	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	357	178	65	N	115, 116
1	Moxie Gore	D	ISTR-52-02	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	324	186	79	N	115, 116

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
1	Moxie Gore	D	ISTR-52-03	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	329	104	104	N	115, 116
1	Moxie Gore	D	ISTR-52-04	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	225	22	0	N	116
1	Moxie Gore	D	ISTR-52-05	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	225	1	0	N	116
1	Moxie Gore	D	ISTR-52-06	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	352	17	0	N	116
1	The Forks Plt	D	ISTR-52-07	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	369	84	0	N	116
1	Moxie Gore/The Forks Plt	D	ISTR-52-08	Trib. to Moxie Stream	1	INT	N/A	Y	N	Y	203	159	46	N	116
1	The Forks Plt	D	ISTR-52-09	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	332	27	0	N	116
1	The Forks Plt	D	ISTR-52-10	Trib. to Moxie Stream	3	INT	N/A	Y	N	Y	276	414	171	Y	116, 117
1	The Forks Plt	D	ISTR-52-11	Trib. to Moxie Stream	4	INT	N/A	Y	N	Y	348	80	0	N	116, 117
1	The Forks Plt	D	ISTR-52-12	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	259	85	0	N	116, 117
1	The Forks Plt	D	ISTR-52-13	Trib. to Moxie Stream	8	INT	N/A	Y	N	Y	251	4	0	N	117
1	The Forks Plt	D	ISTR-52-14	Trib. to Moxie Stream	6	INT	N/A	Y	N	Y	217	239	77	N	117
1	The Forks Plt	D	ISTR-52-15	Trib. to Moxie Stream	5	INT	N/A	Y	N	Y	237	14	0	N	117
1	The Forks Plt	D	ISTR-52-16	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	250	144	65	N	117
1	The Forks Plt	D	ISTR-52-17	Trib. to Moxie Stream	2	INT	N/A	Y	N	Y	290	29	16	N	117
1	Johnson Mountain Twp	E	ISTR-EM-33-01	Trib. To Twomile Brook	5	INT	N/A	Y	N	Y	235	354	192	N	75
1	Johnson Mountain Twp	E	ISTR-EM-34-03	Trib. To Mountain	5	INT	N/A	Y	N	Y	63	345	155	Y	77
1	Johnson Mountain Twp	E	ISTR-EM-34-05	Trib. To Mountain	5	INT	N/A	Y	N	Y	258	369	201	Y	77
1	Appleton Twp	E	PSTR-15-02	Trib. to Gold Brook	2	PER	N/A	Y	N	Y	205	568	246	Y	35
2	Moscow	D	ISTR-66-09	Trib. to Heald Stream	5	INT	N/A	Y	N	Y	96	472	88	Y	148
1	Appleton Twp	E	PSTR-15-06	Gold Brook	25	PER	A	Y	N	Y	181	1014	53	Y	36
2	Moscow	D	ISTR-66-10	Trib. to Heald Stream	5	INT	N/A	Y	N	Y	6	970	172	Y	148, 149
1	Appleton Twp	E	PSTR-16-07	Trib. to Gold Brook	10	PER	A	Y	N	Y	325	216	0	N	37
1	Appleton Twp	E	PSTR-16-10	Trib. to Gold Brook	3	PER	A	Y	N	Y	478	108	0	N	37
1	Appleton Twp	E	PSTR-16-101	Trib. to Gold Brook	3	PER	A	Y	N	Y	356	472	0	N	37

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
1	Appleton Twp	E	PSTR-16-14	Trib. to Gold Brook	4	PER	A	Y	N	Y	336	95	0	N	37
1	Appleton Twp	E	PSTR-17-07	Baker Stream	20	PER	A	Y	N	Y	127	652	330	N	39
1	Appleton Twp	E	PSTR-17R-03	Baker Stream	12	PER	A	Y	N	Y	114	66	66	N	39
1	Appleton Twp	E	PSTR-17R-04	Baker Stream	15	PER	A	Y	N	Y	164	59	60	N	39
1	T5 R7 BKP WKR/Hobbstown Twp	E	PSTR-18-05	Trib. to Fish Pond	5	PER	A	Y	N	Y	453	307	157	Y	42
1	T5 R7 BKP WKR/Hobbstown Twp	E	PSTR-18-06	Trib. to Fish Pond	4	PER	A	Y	N	Y	509	164	164	Y	42
1	T5 R7 BKP WKR	E	PSTR-18-14	Trib. to Fish Pond	8	PER	A	Y	N	Y	147	675	302	Y	41
1	T5 R7 BKP WKR	E	PSTR-18-15	Trib. to Fish Pond	3	PER	A	Y	N	Y	167	61	0	N	41
1	Hobbstown Twp	E	PSTR-20-01	Trib. to Little Spencer Stream	3	PER	A	Y	N	Y	398	255	62	N	46
1	T5 R7 BKP WKR	E	PSTR-21-02	Trib. to Little Spencer Stream	5	PER	A	Y	N	Y	466	252	252	N	48, 49
1	T5 R7 BKP WKR/Hobbstown Twp	E	PSTR-21-03	Trib. to Little Spencer Stream	12	PER	AA	Y	N	Y	389	314	145	Y	48
1	T5 R7 BKP WKR/Hobbstown Twp	E	PSTR-21-04	Little Spencer Stream	25	PER	AA	Y	N	Y	459	370	194	N	48
1	T5 R7 BKP WKR	E	PSTR-21-2A	Trib. to Little Spencer Stream	5	PER	A	Y	N	Y	535	188	31	N	48, 49
1	T5 R7 BKP WKR	E	PSTR-23-01	Trib. to Whipple Brook	3	PER	N/A	Y	N	Y	176	105	0	N	52
1	T5 R7 BKP WKR	E	PSTR-23-02	Whipple Brook	60	PER	A	Y	N	Y	370	831	0	N	52
1	Johnson Mountain Twp	E	PSTR-33-01	Mountain Brook	18	PER	A	Y	N	Y	147	415	0	N	76
1	Johnson Mountain Twp	E	PSTR-35-02	Trib. to Salmon Stream	2	PER	A	Y	N	Y	216	415	158	Y	80
1	Johnson Mountain Twp	E	PSTR-38-02	Trib. to East Branch Salmon Stream	4	PER	A	Y	N	Y	422	410	221	Y	87
1	Johnson Mountain Twp	E	PSTR-38-06	Trib. to East Branch Salmon Stream	6	PER	A	Y	N	Y	133	431	166	Y	86, 87
1	Johnson Mountain Twp	E	PSTR-38-10	Trib. to East Branch Salmon Stream	6	PER	A	Y	N	Y	133	354	166	Y	86
1	Johnson Mountain Twp	E	PSTR-38-15	Trib. to East Branch Salmon Stream	4	PER	A	Y	N	Y	207	335	166	N	85
1	Johnson Mountain Twp	E	PSTR-39-02	Trib. to Cold Stream	2	PER	N/A	Y	N	Y	248	445	274	Y	88, 89
1	Johnson Mountain Twp	E	PSTR-40-06	Cold Stream	25	PER	AA	Y	N	Y	467	660	288	N	91
1	Johnson Mountain Twp	E	PSTR-40-07	Trib. to Cold Stream	5	PER	N/A	Y	N	Y	200	1153	0	N	91, 92
1	Johnson Mountain Twp	E	PSTR-40-08	Trib. to Cold Stream	2	PER	N/A	Y	N	Y	401	5	0	N	91

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	E	PSTR-40-09	Trib. to Cold Stream	2	PER	N/A	Y	N	Y	314	85	0	N	91
1	Johnson Mountain Twp	E	PSTR-41-04	Trib. to Cold Stream	2	PER	N/A	Y	N	Y	296	145	0	N	92
1	Johnson Mountain Twp	E	PSTR-42-03	Trib. to Tomhegan Stream	40	PER	A	Y	N	Y	169	420	247	N	95
1	West Forks Plt	D	PSTR-44-01 (TOB)	Tomhegan Stream	15	PER	A	Y	N	Y	241	1124	417	Y	100
1	West Forks Plt	D	PSTR-44-02	Tomhegan Stream	15	PER	N/A	Y	N	Y	465	1	0	N	100
1	West Forks Plt	D	PSTR-44-04	Tomhegan Stream	15	PER	A	Y	N	Y	335	109	109	Y	100
1	West Forks Plt	D	PSTR-44-05	Tomhegan Stream	5	PER	A	Y	N	Y	397	187	34	N	100
1	West Forks Plt	D	PSTR-44-06	Tomhegan Stream	5	PER	A	Y	N	Y	268	348	185	Y	100
1	West Forks Plt	D	PSTR-44-07	Tomhegan Stream	3	PER	N/A	Y	N	Y	155	326	163	Y	100
1	West Forks Plt	D	PSTR-44-09	Tomhegan Stream	4	PER	A	Y	N	Y	300	35	0	N	100
1	West Forks Plt	D	PSTR-45-01	Trib. to Cold stream	10	PER	N/A	Y	N	Y	214	394	188	N	102
1	West Forks Plt	D	PSTR-45-03	Trib. to Tomhegan Stream	5	PER	N/A	Y	N	Y	107	417	242	Y	100
1	West Forks Plt	D	PSTR-45-3	Tomhegan Stream	6	PER	A	Y	N	Y	368	210	55	N	100
1	West Forks Plt	D	PSTR-46-04	Trib. To Kennebec River	10	PER	N/A	Y	N	Y	151	502	0	N	104
1	West Forks Plt/Moxie Gore	D	PSTR-48-03	Kennebec River	300	PER	AA	Y	N	Y	732	1029	0	N	109
1	Johnson Mountain Twp	E	PSTR-EM-34-01	Mountain Brook	9	PER	A	Y	N	Y	233	25	0	N	76
1	Moxie Gore	D	STRM-50-01	Moxie Stream	80	PER	AA	Y	N	Y	404	747	230	N	113
2	Moscow	D	ESTR-66-12	Trib. to Heald Stream	2	INT	N/A	Y	N	Y	485	84	37	N	148, 149
2	The Forks Plt	D	ISTR-53-01	Trib. to Moxie Pond	2	INT	N/A	Y	N	Y	155	62	32	N	119
2	The Forks Plt	D	ISTR-54-01		9	INT	A	Y	N	Y	176	216	52	Y	120
2	The Forks Plt	D	ISTR-54-02	Trib. to Moxie Pond	3	INT	A	Y	N	Y	103	118	68	Y	120
2	The Forks Plt	D	ISTR-55-01	Trib. to Moxie Pond	6	INT	N/A	Y	N	Y	445	164	70	Y	123
2	The Forks Plt	D	ISTR-55-02	Trib. to Moxie Pond	2	INT	N/A	Y	N	Y	523	93	45	N	123
2	The Forks Plt	D	ISTR-55-03	Trib. to Moxie Pond	1.5	INT	N/A	Y	N	Y	494	95	51	N	123
2	The Forks Plt	D	ISTR-56-03	Trib. to Moxie Pond	2	INT	N/A	Y	N	Y	181	60	0	N	125

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
2	The Forks Plt	D	ISTR-57-02	Trib. to Mosquito Stream	5	INT	A	Y	N	Y	180	18	0	N	127
2	Bald Mountain Twp T2 R3	D	ISTR-59-02	Trib. to Little Sandy Stream	6	INT	A	Y	N	Y	185	311	188	Y	131
2	Bald Mountain Twp T2 R3	D	ISTR-60-05	Trib. to Joes Hole	2.5	INT	N/A	Y	N	Y	134	153	0	N	134
2	Bald Mountain Twp T2 R3	D	ISTR-60-08	Trib. to Joes Hole	2	INT	N/A	Y	N	Y	267	441	95	Y	133
2	Bald Mountain Twp T2 R3	D	ISTR-61-05	Trib. to Wild Brook	1	INT	N/A	Y	N	Y	371	64	0	N	136
2	Bald Mountain Twp T2 R3	D	ISTR-62-01	Trib. to Wild Brook	3	INT	N/A	Y	N	Y	267	315	77	N	139
2	Bald Mountain Twp T2 R3	D	ISTR-62-02	Trib. to Wild Brook	3	INT	N/A	Y	N	Y	342	28	0	N	139
2	Bald Mountain Twp T2 R3	D	ISTR-62-03	Trib. to Wild Brook	3	INT	N/A	Y	N	Y	255	353	73	N	140
2	Bald Mountain Twp T2 R3	D	ISTR-63-05	Trib. to Wild Brook	2.5	INT	N/A	Y	N	Y	438	78	5	N	140
2	Bald Mountain Twp T2 R3	D	ISTR-63-07	Trib. to Wild Brook	2	INT	N/A	Y	N	Y	467	120	79	N	141
2	Bald Mountain Twp T2 R3	D	ISTR-63-08	Trib. to Wild Brook	3	INT	N/A	Y	N	Y	438	26	0	N	141
2	Bald Mountain Twp T2 R3	D	ISTR-63-09	Trib. to Wild Brook	3	INT	N/A	Y	N	Y	322	31	0	N	141
2	Bald Mountain Twp T2 R3	D	ISTR-64-03	Trib. to Wild Brook	2.5	INT	N/A	Y	N	Y	394	142	15	N	142, 143
2	Bald Mountain Twp T2 R3	D	ISTR-64-05	Trib. to Wild Brook	3	INT	N/A	Y	N	Y	303	92	32	N	142
2	Moscow	D	ISTR-65-04	Trib. to Little Heald Brook	2.5	INT	A	Y	N	Y	220	35	0	N	146
2	Moscow	D	ISTR-66-05	Heald Stream	3	INT	A	Y	N	Y	454	66	44	N	147
2	Moscow	D	ISTR-66-06	Trib. to Heald Stream	6	INT	N/A	Y	N	Y	239	448	80	Y	147
2	Moscow	D	ISTR-66-07	Trib. to Heald Stream	4	INT	N/A	Y	N	Y	263	377	82	Y	147
2	Moscow	D	ISTR-66-08	Trib. to Heald Stream	5	INT	N/A	Y	N	Y	285	109	10	N	148
2	Moscow	D	ISTR-72-101	Trib. to Chase Stream	3	INT	N/A	Y	N	Y	67	527	78	Y	159, 160
2	Moscow	D	ISTR-72-102	Trib. to Chase Stream	3	INT	N/A	Y	N	Y	85	101	0	N	159
2	Moscow	D	ISTR-67-01	Trib. to Austin Stream	6	INT	N/A	Y	N	Y	112	1373	312	Y	149, 150
2	Moscow	D	ISTR-69-01	Trib. to Austin Stream	7	INT	N/A	Y	N	Y	132	479	479	N	156, 157
2	Moscow	D	ISTR-71-101	Trib. to Austin Stream	1	INT	N/A	Y	N	Y	289	204	101	N	158
2	Moscow	D	ISTR-73-05	Trib. to Mink Brook	2	INT	A	Y	N	Y	63	444	99	Y	161, 162

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
2	Moscow	D	ISTR-73-06	Trib. to Mink Brook	3	INT	N/A	Y	N	Y	56	1020	290	N	162
2	Moscow	D	ISTR-72-106	Trib. to Chase Stream	2	INT	N/A	Y	N	Y	502	137	46	Y	160
2	Moscow	D	ISTR-72-107	Trib. to Chase Stream	8	INT	A	Y	N	Y	325	279	0	N	160
2	Moscow	D	ISTR-73-02	Mink Brook	1.5	INT	A	Y	N	Y	611	14	0	N	161
2	Moscow	D	ISTR-73-03	Mink Brook	2	INT	A	Y	N	Y	480	106	0	N	161
3	Industry	D	ISTR-103-03	Trib. to Goodrich Brook	3	INT	N/A	Y	Y	Y	95	255	0	N	228, 229
3	Industry	D	ISTR-103-15	Trib. to Goodrich Brook	3	INT	N/A	Y	Y	Y	47	442	199	N	227
2	Moscow	D	ISTR-73-07	Mink Brook	3	INT	A	Y	N	Y	204	124	39	N	161
2	Moscow	D	ISTR-73-08	Trib. to Austin Stream	2	INT	N/A	Y	N	Y	547	275	51	Y	163
2	Bald Mountain Twp T2 R3	D	POND-59-05	Joes Hole	100	Open Water	N/A	Y	N	Y	105	668	0	N	131, 132
2	Bald Mountain Twp T2 R3	D	POND-60-01	Joes Hole	180	Open Water	A	Y	N	Y	108	1138	99	N	133, 134
2	The Forks Plt	D	PSTR-54-01	Trib. to Moxie Pond	9	PER	A	Y	N	Y	177	212	55	N	120
2	The Forks Plt	D	PSTR-57-01	Mosquito Stream	10	PER	A	Y	N	Y	123	358	76	N	127
2	Bald Mountain Twp T2 R3	D	PSTR-59-01	Little Sandy Stream	15	PER	A	Y	N	Y	309	766	149	Y	131
2	Bald Mountain Twp T2 R3	D	PSTR-60-01	Trib. to Baker Stream	4	PER	N/A	Y	N	Y	161	33	0	N	135
2	Bald Mountain Twp T2 R3	D	PSTR-60-02	Trib. to Baker Stream	2	PER	N/A	Y	N	Y	196	441	85	Y	135
2	Bald Mountain Twp T2 R3	D	PSTR-60-06	Trib. to Joes Hole	5	PER	A	Y	N	Y	376	298	111	N	133
2	Bald Mountain Twp T2 R3	D	PSTR-60-07	Trib. to Joes Hole	2.5	PER	A	Y	N	Y	379	149	89	Y	133
2	Bald Mountain Twp T2 R3	D	PSTR-61-01	Wild Brook	5	PER	A	Y	N	Y	511	349	77	Y	137
2	Bald Mountain Twp T2 R3	D	PSTR-61-08	Trib. to Baker Stream	3.5	PER	N/A	Y	N	Y	237	308	113	N	136
2	Bald Mountain Twp T2 R3	D	PSTR-63-03	Wild Brook	7	PER	A	Y	N	Y	405	435	76	N	140
2	Bald Mountain Twp T2 R3	D	PSTR-63-04	Wild Brook	7	PER	A	Y	N	Y	308	443	89	Y	140
2	Bald Mountain Twp T2 R3	D	PSTR-63-06	Trib. to Wild Brook	4	PER	N/A	Y	N	Y	333	283	107	N	141
2	Bald Mountain Twp T2 R3	D	PSTR-63-10	Trib. to Wild Brook	6	PER	N/A	Y	N	Y	229	389	74	N	142
2	Bald Mountain Twp T2 R3	D	PSTR-63-11	Trib. to Wild Brook	4	PER	N/A	Y	N	Y	297	530	0	N	142

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
2	Bald Mountain Twp T2 R3	D	PSTR-64-02	Trib. to Wild Brook	5	PER	N/A	Y	N	Y	438	134	71	N	142, 143
2	Bald Mountain Twp T2 R3	D	PSTR-64-06	Trib. to Wild Brook	4	PER	N/A	Y	N	Y	118	538	0	N	143
3	Farmington	D	ISTR-108-05	Trib. to Cascade Brook	1.5	INT	N/A	Y	Y	Y	22	472	162	N	239
3	Farmington	D	ISTR-108-07	Trib. to Cascade Brook	4	INT	B	Y	Y	Y	86	2341	112	N	239, 240
2	Moscow	D	PSTR-65-03	Little Heald Stream	2.5	PER	A	Y	N	Y	139	114	0	Y	146
2	Moscow	D	PSTR-66-02	Heald Stream	15	PER	A	Y	N	Y	463	865	115	N	146, 147
2	Moscow	D	PSTR-71-102	Trib. to Austin Stream	4	PER	N/A	Y	N	Y	376	230	0	N	157
2	Moscow	D	PSTR-72-103	Chase Stream	30	PER	A	Y	N	Y	109	2801	734	Y	159, 160
2	Moscow	D	PSTR-72-104	Trib. to Chase Stream	3.5	PER	A	Y	N	Y	221	215	112	Y	159, 160
2	Moscow	D	PSTR-72-105	Trib. to Chase Stream	2	PER	A	Y	N	Y	238	45	45	N	159, 160
3	Farmington	D	ISTR-108-08	Trib. to Cascade Brook	1.5	INT	B	Y	Y	Y	57	497	497	N	239
3	Farmington	D	ISTR-111-03	Trib. to Wilson Stream	4	INT	N/A	Y	Y	Y	50	499	213	N	246
2	Moscow	D	PSTR-74-01	Trib. to Kennebec River	2	PER	B	Y	N	Y	115	657	127	N	164, 165
3	Starks	D	ISTR-100-01	Trib. To Meadow Brook	2	INT	B	Y	Y	Y	498	126	65	N	220
3	Starks	D	ISTR-100-02	Trib. To Meadow Brook	2	INT	N/A	Y	Y	Y	489	458	78	Y	221
3	Starks	D	ISTR-100-03	Trib. To Meadow Brook	1	INT	B	Y	Y	Y	311	494	87	Y	221
3	Industry	D	ISTR-101-01	Trib. to Josiah Brook	5	INT	N/A	Y	Y	Y	362	96	0	N	223
3	Industry	D	ISTR-101-02	Trib. to Josiah Brook	2	INT	N/A	Y	Y	Y	326	97	0	N	223
3	Industry	D	ISTR-101-04	Trib. to Josiah Brook	4	INT	N/A	Y	Y	Y	206	47	0	N	223
3	Industry	D	ISTR-101-06	Trib. to Josiah Brook	3	INT	N/A	Y	Y	Y	502	467	90	Y	224
3	Industry	D	ISTR-102-01	Trib. to Josiah Brook	8	INT	B	Y	Y	Y	220	325	22	N	225, 226
3	Industry	D	ISTR-102-02	Trib. to Josiah Brook	5	INT	B	Y	Y	Y	183	242	81	Y	225
3	Industry	D	ISTR-102-03	Trib. to Goodrich Brook	3	INT	N/A	Y	Y	Y	396	269	51	N	227
3	Industry	D	ISTR-103-01	Trib. to Goodrich Brook	5	INT	N/A	Y	Y	Y	345	201	0	Y	229
3	Industry	D	ISTR-103-02	Trib. to Goodrich Brook	1.5	INT	N/A	Y	Y	Y	265	91	0	N	229

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Jay	D	ISTR-116-03	Trib. to Sugar Brook	2	INT	N/A	Y	Y	Y	91	593	124	Y	256
3	Industry	D	ISTR-103-04	Trib. to Goodrich Brook	3	INT	N/A	Y	Y	Y	116	168	78	Y	228, 229
3	Industry	D	ISTR-103-05	Trib. to Goodrich Brook	3	INT	N/A	Y	Y	Y	179	64	36	N	228
3	Industry	D	ISTR-103-06	Trib. to Goodrich Brook	1.5	INT	N/A	Y	Y	Y	367	53	0	N	228
3	Industry	D	ISTR-103-07	Trib. to Goodrich Brook	5	INT	B	Y	Y	Y	341	40	0	N	228
3	Industry	D	ISTR-103-08	Trib. to Goodrich Brook	4	INT	N/A	Y	Y	Y	203	73	0	N	227, 228
3	Industry	D	ISTR-103-09	Trib. to Goodrich Brook	5	INT	N/A	Y	Y	Y	283	79	0	N	227, 228
3	Industry	D	ISTR-103-10	Trib. to Goodrich Brook	4	INT	N/A	Y	Y	Y	318	162	0	N	227
3	Jay	D	ISTR-117-01	Trib. to Fuller Brook	2	INT	N/A	Y	Y	Y	96	843	200	N	259
3	Industry	D	ISTR-103-16	Trib. to Goodrich Brook	5	INT	N/A	Y	Y	Y	368	74	0	N	227
3	Industry	D	ISTR-104-01	Trib. to Goodrich Brook	2	INT	N/A	Y	Y	Y	416	92	0	N	229
3	Industry	D	ISTR-104-02	Trib. to Goodrich Brook	4	INT	B	Y	Y	Y	150	125	93	N	230
3	Farmington	D	ISTR-107-01	Trib. to Beales Brook	1.5	INT	B	Y	Y	Y	281	260	99	N	238
3	Farmington	D	ISTR-107-03	Trib. to Beales Brook	1	INT	N/A	Y	Y	Y	236	133	80	N	236, 237
3	Farmington	D	ISTR-108-01	Trib. to Cascade Brook	3	INT	N/A	Y	Y	Y	201	376	0	N	240
3	Farmington	D	ISTR-108-02	Trib. to Cascade Brook	2.5	INT	B	Y	Y	Y	247	239	80	Y	240
3	Farmington	D	ISTR-108-03	Trib. to Cascade Brook	1.5	INT	B	Y	Y	Y	274	54	24	N	240
3	Farmington	D	ISTR-108-04	Trib. to Cascade Brook	1	INT	B	Y	Y	Y	193	132	74	Y	239
3	Jay	D	ISTR-117-03	Trib. To Fuller Brook	4	INT	N/A	Y	Y	Y	57	323	311	N	259
3	Farmington	D	ISTR-108-06	Trib. to Cascade Brook	1.5	INT	B	Y	Y	Y	320	170	0	N	239
3	Livermore Falls	B	ISTR-123-01	Trib. to Clay Brook	4	INT	B	Y	N	Y	85	103	0	N	272
3	Livermore Falls	B	ISTR-128-03	Trib. to Androscoggin River	2	INT	C	Y	N	Y	98	273	115	Y	283
3	Farmington	D	ISTR-108-09	Trib. to Cascade Brook	1	INT	B	Y	Y	Y	402	150	102	N	239
3	Farmington	D	ISTR-109-01	Trib. to Cascade Brook	3	INT	B	Y	Y	Y	163	343	0	N	241
3	Farmington	D	ISTR-109-03	Trib. to Cascade Brook	3	INT	N/A	Y	Y	Y	435	661	231	Y	241

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Farmington	D	ISTR-111-01	Trib. to Wilson Stream	2	INT	N/A	Y	Y	Y	162	107	0	N	246
3	Farmington	D	ISTR-111-02	Trib. to Wilson Stream	3.5	INT	N/A	Y	Y	Y	240	159	0	N	246, 247
3	Leeds	B	ISTR-130-02	Trib. to Androscoggin River	3	INT	C	Y	N	Y	58	248	106	Y	287
3	Jay	D	ISTR-114-02	Trib. to Wilson Stream	3	INT	N/A	Y	Y	Y	129	166	8	N	253
3	Chesterville	D	ISTR-114-03	Trib. to Wilson Stream	6	INT	N/A	Y	Y	Y	137	522	86	Y	253
3	Chesterville	D	ISTR-114-06	Trib. to Wilson Stream	5	INT	B	Y	Y	Y	219	309	0	N	252
3	Jay	D	ISTR-116-02	Trib. To Sugar Brook	8	INT	N/A	Y	Y	Y	341	493	96	Y	256
3	Leeds	B	ISTR-131-01	Trib. to Dead River	4	INT	B	Y	N	Y	15	852	231	Y	289
3	Leeds	B	ISTR-134-03	Trib. to Allen Stream	2.5	INT	B	Y	N	Y	51	552	467	N	297
3	Greene	A	ISTR-138-01	Trib. to Allen Pond	4	INT	B	Y	N	Y	100	490	118	N	307
3	Jay	D	ISTR-121-01	Trib. to Clay Brook	3	INT	B	Y	N	Y	227	24	0	N	268
3	Lewiston	A	ISTR-PERRON-1	Trib. to Stetson Brook	0	INT	N/A	Y	N	Y	27	41	212	N	320
3	Livermore Falls	B	ISTR-123-02	Trib. to Clay Brook	3	INT	B	Y	N	Y	114	230	185	N	272
3	Livermore Falls	B	ISTR-123-03	Trib. to Clay Brook	4	INT	B	Y	N	Y	150	205	0	N	272
3	Livermore Falls	B	ISTR-124-01	Trib. to Androscoggin River	3	INT	C	Y	N	Y	253	194	30	N	274
3	Livermore Falls	B	ISTR-124-02	Trib. to Androscoggin River	3	INT	C	Y	N	Y	429	325	0	N	274
3	Livermore Falls	B	ISTR-125-02	Trib. to Androscoggin River	2	INT	C	Y	N	Y	482	0	0	N	277
3	Livermore Falls	B	ISTR-125-05	Trib. to Androscoggin River	4	INT	C	Y	N	Y	319	45	0	N	277
3	Livermore Falls	B	ISTR-125-06	Trib. to Androscoggin River	2	INT	C	Y	N	Y	244	56	0	N	277
3	Livermore Falls	B	ISTR-126-01	Trib. to Androscoggin River	3	INT	C	Y	N	Y	297	440	83	N	279
3	Livermore Falls	B	ISTR-126-04	Trib. to Androscoggin River	3	INT	C	Y	N	Y	132	421	78	Y	280
3	Livermore Falls	B	ISTR-126-06	Trib. to Androscoggin River	2	INT	C	Y	N	Y	422	254	0	N	279
3	Livermore Falls	B	ISTR-127-01	Trib. to Androscoggin River	10	INT	N/A	Y	N	Y	411	406	48	Y	280, 281
3	Livermore Falls	B	ISTR-127-03	Trib. to Hunton Brook	30	INT	B	Y	N	Y	529	152	94	N	282
3	Livermore Falls	B	ISTR-128-02	Trib. to Androscoggin River	2	INT	C	Y	N	Y	234	287	0	N	283

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
5	Windsor	B	ISTR-162-04	Trib. to West Branch Sheepscot River	2	INT	B	Y	Y	Y	86	91	0	N	417
3	Leeds	B	ISTR-130-01	Trib. to Dead River	8	INT	B	Y	N	Y	296	90	24	N	289
5	Windsor	B	ISTR-162-07	Trib. to West Branch Sheepscot River	8	INT	B	Y	Y	Y	84	1159	0	N	417
3	Leeds	B	ISTR-130-03	Trib. to Androscoggin River	3	INT	C	Y	N	Y	351	480	107	Y	287, 288
5	Windsor	B	ISTR-162-14	Trib. to West Branch Sheepscot River	8	INT	B	Y	Y	Y	53	761	0	N	416
3	Leeds	B	ISTR-131-02	Trib. To Dead River	3	INT	B	Y	N	Y	142	144	0	N	291
3	Leeds	B	ISTR-132-01	Trib. To Dead River	3	INT	B	Y	N	Y	183	127	77	Y	292
3	Leeds	B	ISTR-132-02	Trib. To Dead River	3	INT	B	Y	N	Y	272	49	0	N	292
3	Leeds	B	ISTR-134-01	Trib. to Allen Stream	2	INT	B	Y	N	Y	120	535	180	Y	298
3	Leeds	B	ISTR-134-02	Trib. to Allen Stream	2.5	INT	B	Y	N	Y	116	164	0	N	297
5	Whitefield	B	ISTR-166-01	Trib. To Finn Brook	2	INT	N/A	Y	Y	Y	71	224	0	N	408
3	Leeds	B	ISTR-135-02	Trib. to Allen Stream	2	INT	B	Y	N	Y	167	1257	297	Y	299
3	Leeds	B	ISTR-135-03	Trib. to Allen Stream	2	INT	B	Y	N	Y	152	3114	289	N	299, 300
3	Leeds	B	ISTR-135-04	Trib. to Allen Stream	4	INT	B	Y	N	Y	206	49	0	N	299
5	Whitefield	B	ISTR-169-04	Trib. to East Branch Eastern River	1	INT	N/A	Y	Y	Y	48	329	0	N	402
3	Greene	A	ISTR-138-02	Trib. to Allen Pond	4	INT	B	Y	N	Y	312	494	0	N	307
3	Greene	A	ISTR-138-03	Trib. to Allen Stream	3	INT	B	Y	N	Y	254	260	79	N	306
3	Greene	A	ISTR-139-03	Trib. to Allen Pond	2	INT	B	Y	N	Y	278	244	107	N	309
3	Greene	A	ISTR-140-02	Trib. to Allen Pond	1.5	INT	B	Y	N	Y	140	203	43	N	309
3	Greene	A	ISTR-140-03	Trib. to Allen Pond	6	INT	B	Y	N	Y	197	1161	0	Y	310
3	Greene	A	ISTR-140-04	Trib. to Allen Pond	3	INT	B	Y	N	Y	296	82	0	N	309
3	Greene	A	ISTR-140-05	Trib. to Allen Pond	3	INT	B	Y	N	Y	265	74	0	N	309
3	Greene	A	ISTR-140-07	Trib. to Allen Pond	2	INT	B	Y	N	Y	151	570	0	N	310, 311
3	Greene	A	ISTR-141-02	Trib. to Daggett Bog	4	INT	B	Y	N	Y	268	244	102	N	312
3	Lewiston	A	ISTR-145-02	Trib. to Stetson Brook	2	INT	C	Y	N	Y	157	98	0	N	322

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Lewiston	A	ISTR-145-03	Trib. to Stetson Brook	8	INT	C	Y	N	Y	230	17	0	N	321
3	Lewiston	A	ISTR-146-04	Trib. to Stetson Brook	2	INT	C	Y	N	Y	482	5	0	N	323
3	Concord Twp	D	ISTR-75-03	Trib. to Kennebec River	4	INT	N/A	Y	N	Y	269	197	0	Y	167
3	Concord Twp	D	ISTR-76-02	Trib. to Kennebec River	1	INT	N/A	Y	N	Y	270	140	0	N	167
3	Concord Twp	D	ISTR-76-03	Trib. to Kennebec River	20	INT	B	Y	N	Y	558	38	0	N	167
3	Concord Twp	D	ISTR-76-04	Trib. to Kennebec River	2	INT	B	Y	N	Y	386	80	0	N	167
3	Concord Twp	D	ISTR-76-05	Trib. to Kennebec River	15	INT	N/A	Y	N	Y	282	192	0	N	167, 168
3	Concord Twp	D	ISTR-76-06	Trib. to Kennebec River	20	INT	N/A	Y	N	Y	238	902	106	N	169
3	Concord Twp	D	ISTR-77-03	Trib. to Kennebec River	2.5	INT	N/A	Y	N	Y	228	213	0	N	171
3	Concord Twp	D	ISTR-78-01	Trib. To Mill Stream	3	INT	N/A	Y	N	Y	251	146	0	N	173
3	Concord Twp	D	ISTR-78-02	Trib. To Mill Stream	3	INT	N/A	Y	N	Y	301	179	0	N	173
3	Concord Twp	D	ISTR-80-01	Trib. to Kennebec River	2	INT	N/A	Y	N	Y	495	281	55	N	177
3	Concord Twp	D	ISTR-80-02	Trib. to Kennebec River	3	INT	N/A	Y	N	Y	187	177	0	N	176
3	Concord Twp	D	ISTR-80-03	Trib. to Kennebec River	2	INT	N/A	Y	N	Y	188	203	18	N	176
3	Concord Twp	D	ISTR-80-04	Trib. to Kennebec River	1.5	INT	N/A	Y	N	Y	526	96	0	N	177
3	Concord Twp	D	ISTR-80-05	Trib. to Kennebec River	3	INT	N/A	Y	N	Y	286	119	0	N	177
3	Concord Twp	D	ISTR-81-01	Trib. to Kennebec River	4	INT	N/A	Y	N	Y	295	62	0	N	178, 179
3	Concord Twp	D	ISTR-81-02	Trib. to Kennebec River	4	INT	N/A	Y	N	Y	281	57	0	N	178, 179
3	Embden	D	ISTR-82-01	Trib. to Alder Brook	5	INT	N/A	Y	N	Y	427	64	0	N	182, 183
3	Embden	D	ISTR-83-02	Trib. to Alder Brook	4	INT	N/A	Y	N	Y	475	373	98	N	184
3	Embden	D	ISTR-83-05	Trib. to Alder Brook	3	INT	B	Y	N	Y	309	390	0	N	184
3	Embden	D	ISTR-83-06	Trib. to Alder Brook	2	INT	B	Y	N	Y	281	76	44	Y	183, 184
3	Embden	D	ISTR-84-01	Trib. to Alder Brook	4	INT	N/A	Y	N	Y	312	254	0	N	185
3	Embden	D	ISTR-85-01	Jackin Brook	2	INT	B	Y	N	Y	158	1272	251	N	187, 188
3	Embden	D	ISTR-85-01	Trib. to Jackin Brook	2	INT	B	Y	N	Y	158	1272	251	N	187, 188

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Anson	D	ISTR-88-01	Trib. to Fahi Brook	1	INT	B	Y	N	Y	629	120	0	N	196
3	Anson	D	ISTR-89-03	Trib. to Fahi Brook	3.5	INT	B	Y	N	Y	311	258	0	N	196
3	Anson	D	ISTR-90-04	Trib. to Carrabassett River	1.5	INT	N/A	Y	Y	Y	212	268	0	N	200
3	Anson	D	ISTR-92-01	Trib. to Carrabassett River	2	INT	N/A	Y	Y	Y	400	677	128	N	204
3	Anson	D	ISTR-92-02	Trib. to Carrabassett River	1.5	INT	N/A	Y	Y	Y	381	97	0	N	204
3	Anson	D	ISTR-92-05	Trib. to Gilman Brook	4.5	INT	N/A	Y	Y	Y	375	126	0	N	205
3	Anson	D	ISTR-93-02	Trib. to Getchell Brook	4	INT	B	Y	Y	Y	162	1998	191	Y	208
3	Anson	D	ISTR-95-01	Trib. to Kennebec River	2.5	INT	B	Y	Y	Y	111	1145	136	Y	209, 210
3	Anson	D	ISTR-95-02	Trib. to Kennebec River	6	INT	N/A	Y	Y	Y	416	416	0	N	209, 210
3	Anson	D	ISTR-95-03	Trib. to Kennebec River	1	INT	N/A	Y	Y	Y	504	135	0	N	210
3	Anson	D	ISTR-95-04	Trib. to Kennebec River	1	INT	B	Y	Y	Y	412	117	0	N	210
3	Starks	D	ISTR-96-03	Trib. to Pelton Brook	2	INT	N/A	Y	Y	Y	273	205	40	N	212
3	Starks	D	ISTR-96-04	Trib. to Pelton Brook	3	INT	N/A	Y	Y	Y	485	53	0	N	212
3	Starks	D	ISTR-96-07	Trib. to Pelton Brook	3	INT	N/A	Y	Y	Y	439	111	0	N	213
3	Starks	D	ISTR-96-08	Trib. to Pelton Brook	4	INT	N/A	Y	Y	Y	236	99	0	N	213
3	Starks	D	ISTR-96-09	Trib. to Pelton Brook	2	INT	N/A	Y	Y	Y	243	188	0	N	213
3	Starks	D	ISTR-96-10	Trib. to Pelton Brook	5	INT	N/A	Y	Y	Y	286	237	62	N	213
3	Starks	D	ISTR-96-11	Trib. to Pelton Brook	2	INT	N/A	Y	Y	Y	301	55	0	N	213
3	Starks	D	ISTR-96-12	Trib. to Pelton Brook	2	INT	N/A	Y	Y	Y	224	125	82	N	213
3	Starks	D	ISTR-97-02	Trib. to Pelton Brook	100	INT	N/A	Y	Y	Y	461	114	0	N	214, 215
3	Starks	D	ISTR-97-03	Trib. to Pelton Brook	2.5	INT	N/A	Y	Y	Y	495	108	0	N	214, 215
3	Starks	D	ISTR-97-04	Trib. to Pelton Brook	3	INT	N/A	Y	Y	Y	340	204	82	Y	214, 215
3	Starks	D	ISTR-97-06	Trib. to Cold Pond/Hilton Brook	4	INT	N/A	Y	Y	Y	487	149	0	N	216
3	Starks	D	ISTR-97-07	Trib. to Cold Pond/Hilton Brook	2	INT	N/A	Y	Y	Y	568	204	76	Y	216
3	Starks	D	ISTR-98-01	Trib. to Lemon Stream	2	INT	N/A	Y	Y	Y	110	226	87	N	217, 218

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Starks	D	ISTR-99-01	Trib. to Lemon Stream	2	INT	B	Y	Y	Y	150	91	30	N	219
3	Starks	D	ISTR-99-03	Trib. to Lemon Stream	1	INT	B	Y	Y	Y	129	76	21	N	219
3	Starks	D	ISTR-99-04	Trib. to Lemon Stream	3	INT	B	Y	Y	Y	119	539	308	Y	219
3	Starks	D	ISTR-99-07	Lemon Stream	1	INT	N/A	Y	Y	Y	201	139	0	N	220
5	Whitefield	B	ISTR-170-02	Trib. to East Branch Eastern River	2	INT	N/A	Y	N	Y	42	60	0	N	400
3	Industry	D	PSTR-101-03	Trib. to Josiah Brook	6	PER	N/A	Y	Y	Y	164	221	87	N	223
3	Industry	D	PSTR-101-05	Josiah Brook	3	PER	B	Y	Y	Y	235	431	88	Y	224
3	Industry	D	PSTR-103-11	Trib. to Goodrich Brook	7	PER	B	Y	Y	Y	349	502	76	N	228
3	Industry	D	PSTR-103-12	Goodrich Brook	15	PER	B	Y	Y	Y	228	1566	217	Y	229
3	Industry	D	PSTR-103-13	Trib. to Goodrich Brook	7	PER	B	Y	Y	Y	162	486	0	N	229
3	Industry	D	PSTR-103-14	Trib. to Goodrich Brook	8	PER	B	Y	Y	Y	194	155	0	N	229
3	Industry	D	PSTR-104-04	Trib. to Goodrich Brook	6	PER	B	Y	Y	Y	127	463	90	Y	230
3	New Sharon	D	PSTR-105-01	Muddy Brook	40	PER	B	Y	Y	Y	412	932	164	N	232
3	Farmington	D	PSTR-107-02	Trib. to Beales Brook	3.5	PER	B	Y	Y	Y	117	612	80	Y	237
3	Farmington	D	PSTR-107-04	Beales Brook	5	PER	B	Y	Y	Y	416	664	110	N	236
3	Farmington	D	PSTR-109-02	Cascade Brook	8	PER	B	Y	Y	Y	114	2139	12	Y	242
3	Farmington	D	PSTR-110-01	Sandy River	70	PER	B	Y	Y	Y	135	1175	152	N	242, 243
3	Farmington	D	PSTR-112-01	Trib. to Wilson Stream	2	PER	B	Y	Y	Y	304	526	93	Y	249
5	Alna	B	ISTR-180-01	Trib. to Trout Brook	1	INT	B	Y	N	Y	40	511	0	N	377
5	Wiscasset	B	ISTR-181-01	Trib. to Ward Brook	3	INT	N/A	Y	Y	Y	26	414	0	Y	374
3	Chesterville	D	PSTR-114-01	Trib. to Wilson Stream	8	PER	N/A	Y	Y	Y	227	764	85	N	253, 254
3	Chesterville	D	PSTR-114-04	Trib. to Wilson Stream	1	PER	N/A	Y	Y	Y	349	83	0	N	252
5	Wiscasset	B	ISTR-181-02	Ward Brook	2	INT	B	Y	N	Y	42	573	0	Y	374, 375
5	Wiscasset	B	ISTR-183-01	Trib. to Montsweag Brook	2	INT	B	Y	Y	Y	86	317	0	N	370
3	Jay	D	PSTR-116-04	Sugar Brook	3.5	PER	B	Y	Y	Y	302	404	76	Y	257

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Jay	D	PSTR-117-02	Trib. To Fuller Brook	5	PER	N/A	Y	Y	Y	105	725	634	N	258, 259
5	Wiscasset	B	ISTR-183-03	Trib. to Montsweag Brook	2	INT	B	Y	Y	Y	92	436	0	N	370
3	Jay	D	PSTR-118-01	Fuller Brook	15	PER	B	Y	Y	Y	475	979	94	N	262
3	Jay	D	PSTR-119-01	James Brook	15	PER	B	Y	Y	Y	239	943	156	Y	263
3	Jay/Livermore Falls	D	PSTR-121-02	Trib. to Clay Brook	3	PER	B	Y	N	Y	132	1291	0	N	268, 269
3	Livermore Falls	B	PSTR-121-03	Trib. to Clay Brook	2	PER	B	Y	N	Y	329	807	0	N	269
5	Woolwich	B	ISTR-184-04	Trib. to Montsweag Brook	2.5	INT	B	Y	Y	Y	23	292	131	Y	367, 368
3	Livermore Falls	B	PSTR-122-01	Trib. to Clay Brook	5	PER	B	Y	N	Y	466	323	0	N	269, 270
3	Livermore Falls	B	PSTR-122-02	Trib. to Clay Brook	5	PER	B	Y	N	Y	208	311	102	N	270
5	Wiscasset	B	ISTR-184-09	Montsweag Brook	30	INT	B	Y	Y	Y	45	1580	348	N	368, 369
3	Livermore Falls	B	PSTR-122-04	Trib. to Clay Brook	2	PER	B	Y	N	Y	252	98	0	Y	269, 270
3	Livermore Falls	B	PSTR-122-05	Trib. to Clay Brook	6	PER	B	Y	N	Y	295	289	0	N	269
3	Livermore Falls	B	PSTR-122-06	Trib. to Clay Brook	2	PER	B	Y	N	Y	250	319	0	N	269
3	Livermore Falls	B	PSTR-122-07	Trib. to Clay Brook	5	PER	B	Y	N	Y	311	380	0	N	270
3	Livermore Falls	B	PSTR-125-01	Trib. to Androscoggin River	2	PER	C	Y	N	Y	294	107	0	N	276
3	Livermore Falls	B	PSTR-125-02	Trib. to Androscoggin River	2	PER	N/A	Y	N	Y	295	476	93	Y	277
5	Wiscasset	B	ISTR-184-10	Montsweag Brook	2.5	INT	B	Y	Y	Y	66	327	327	N	368
3	Livermore Falls	B	PSTR-125-04	Trib. to Androscoggin River	4	PER	C	Y	N	Y	178	1562	189	N	277, 278
3	Livermore Falls	B	PSTR-126-02	Trib. to Androscoggin River	4	PER	C	Y	N	Y	333	237	0	N	279
3	Livermore Falls	B	PSTR-126-03	Trib. to Androscoggin River	5	PER	C	Y	N	Y	141	459	82	N	280
3	Livermore Falls	B	PSTR-126-05	Trib. to Androscoggin River	4	PER	C	Y	N	Y	346	159	42	N	279
3	Livermore Falls	B	PSTR-127-02	Trib. to Hunton Brook	30	PER	B	Y	N	Y	493	283	0	N	281
3	Livermore Falls	B	PSTR-127-04	Hunton Brook	4	PER	B	Y	N	Y	105	6242	1829	Y	281, 282
3	Livermore Falls	B	PSTR-128-01	Trib. to Androscoggin River	3	PER	C	Y	N	Y	108	475	77	Y	282, 283
3	Livermore Falls	B	PSTR-129-01	Scott Brook	20	PER	B	Y	N	Y	166	494	106	N	285, 286

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
5	Woolwich	B	ISTR-185-03	Trib. to Montsweag Brook	1	INT	B	Y	Y	Y	83	57	21	N	366
3	Leeds	B	PSTR-133-01	Trib. to Allen Stream	3	PER	B	Y	N	Y	183	465	82	Y	295
3	Leeds	B	PSTR-135-01	Trib. to Allen Stream	2	PER	B	Y	N	Y	322	158	0	N	299
3	Leeds	B	PSTR-136-01	Trib. to Androscoggin River	6	PER	B	Y	N	Y	194	629	116	Y	302
3	Greene	A	PSTR-139-01	Trib. to Allen Stream	4	PER	B	Y	N	Y	480	378	47	Y	307
3	Greene	A	PSTR-139-02	Trib. to Allen Stream	4	PER	B	Y	N	Y	500	125	0	N	307
3	Greene	A	PSTR-140-01	Allen Stream	6	PER	B	Y	N	Y	292	463	0	N	310
3	Greene	A	PSTR-140-06	Trib to Allen Pond	4	PER	B	Y	N	Y	324	175	0	Y	310
5	Woolwich	B	ISTR-185-04	Trib. to Montsweag Brook	1	INT	B	Y	Y	Y	57	132	96	N	366
3	Greene	A	PSTR-140-09	Trib. to Allen Pond	4	PER	B	Y	N	Y	132	71	0	N	309
3	Greene	A	PSTR-141-01	Trib. to Daggett Bog	3	PER	B	Y	N	Y	121	637	0	N	312
5	Woolwich	B	ISTR-185-05	Trib. to Montsweag Brook	1	INT	B	Y	Y	Y	69	134	15	Y	366
3	Greene	A	PSTR-143-02	Stetson Brook	10	PER	B	Y	N	Y	210	97	0	N	318
3	Greene	A	PSTR-144-01	Trib. to Stetson Brook	6	PER	B	Y	N	Y	220	193	49	Y	318
3	Greene	A	PSTR-144-02	Trib. to Daggett Bog	2	PER	B	Y	N	Y	232	92	0	N	319
1	Appleton Twp	E	PSTR-15-04	Trib. to Gold Brook	4	PER	N/A	Y	N	Y	85	1005	777	Y	35, 36
3	Lewiston	A	PSTR-146-03	Trib. to Androscoggin River	2	PER	C	Y	N	Y	419	206	0	N	323
3	Lewiston	A	PSTR-146-05	Trib. to Androscoggin River	1	PER	C	Y	N	Y	156	1125	0	N	323
3	Moscow/ Concord Twp	D	PSTR-75-01	Kennebec River	3	PER	A	Y	N	Y	239	4021	86	N	165, 166
3	Concord Twp	D	PSTR-75-02	Trib. to Kennebec River	2	PER	B	Y	N	Y	222	3242	0	N	166
3	Concord Twp	D	PSTR-76-01	Trib. to Kennebec River	0	PER	B	Y	N	Y	215	1397	176	N	167
3	Concord Twp	D	PSTR-77-01	Trib. to Kennebec River	30	PER	N/A	Y	N	Y	293	863	0	N	171
3	Concord Twp	D	PSTR-77-02	Trib. to Kennebec River	2	PER	B	Y	N	Y	293	405	61	N	171
3	Embden	D	PSTR-83-01	Trib. to Alder Brook	6	PER	N/A	Y	N	Y	404	616	98	Y	184
1	Appleton Twp	E	PSTR-16-01	Gold Brook	25	PER	A	Y	N	Y	97	1637	0	N	37

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
3	Embden	D	PSTR-83-04	Alder Brook	8	PER	B	Y	N	Y	584	22	0	N	184
2	Moscow	D	PSTR-65-01	Trib. to Little Heald Brook	3	PER	N/A	Y	N	Y	48	329	43	Y	145
3	Embden	D	PSTR-83-08	Trib. to Alder Brook	6	PER	N/A	Y	N	Y	129	1080	796	Y	182, 183
3	Anson	D	PSTR-89-01	Jackin Brook	4.5	PER	N/A	Y	N	Y	331	552	78	N	196
3	Anson	D	PSTR-89-02	Trib. to Fahi Brook	5	PER	B	Y	N	Y	503	219	0	N	196
3	Anson	D	PSTR-90-01	Trib. to Carrabassett River	5.5	PER	B	Y	N	Y	372	616	0	N	198
2	Moscow	D	PSTR-65-02	Little Heald Brook	25	PER	A	Y	N	Y	85	893	83	Y	146
3	Anson	D	PSTR-91-01	Gilbert Brook	190	PER	B	Y	Y	Y	195	1306	48	N	201
3	Anson	D	PSTR-92-03	Gilman Brook	20	PER	B	Y	Y	Y	373	1407	112	N	205
2	Moscow	D	PSTR-73-01	Mink Brook	2	PER	A	Y	N	Y	32	2412	603	N	161
3	Anson	D	PSTR-93-03	Trib. to Getchell Brook	2	PER	B	Y	Y	Y	413	329	47	N	208
3	Starks	D	PSTR-95-05	Trib. to Kennebec River	2	PER	B	Y	Y	Y	119	524	0	Y	210
3	Starks	D	PSTR-96-01	Trib. to Pelton Brook	20	PER	B	Y	Y	Y	235	1172	360	Y	212
3	Starks	D	PSTR-96-02	Trib. to Pelton Brook	3	PER	B	Y	Y	Y	233	54	0	N	212
3	Starks	D	PSTR-96-05	Pelton Brook	30	PER	B	Y	Y	Y	313	882	55	Y	213
3	Starks	D	PSTR-96-06	Pelton Brook	5	PER	B	Y	Y	Y	349	314	6	N	213
3	Starks	D	PSTR-97-01	Trib. to Pelton Brook	85	PER	B	Y	Y	Y	235	1294	22	N	214
3	Starks	D	PSTR-97-05	Trib. to Cold Pond/Hilton Brook	20	PER	N/A	Y	Y	Y	476	1151	337	N	216
2	Moscow	D	PSTR-73-04	Trib. to Mink Brook	2	PER	A	Y	N	Y	43	296	114	Y	161
3	Farmington	D	PSTR-112-02	Trib. to Wilson Stream	6	PER	N/A	Y	Y	Y	78	689	111	N	247, 248
3	Starks	D	PSTR-99-06	Trib. to Lemon Stream	6	PER	B	Y	Y	Y	411	59	0	N	219
3	Anson	D	WB-94-01	Trib. to Getchell Brook	85	Open Water	B	Y	Y	Y	299	441	0	N	208
4	Lewiston	A	ISTR-150-01	Trib. to No Name Brook	4	INT	B	Y	Y	Y	199	405	0	Y	332
4	Lewiston	A	ISTR-150-02	Trib. to No Name Brook	3	INT	B	Y	Y	Y	211	408	0	Y	333
4	Lewiston	A	ISTR-153-01	Trib. to Androscoggin River	3	INT	C	Y	Y	Y	120	237	0	N	340

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
4	Lewiston	A	ISTR-155-01	Trib. to Androscoggin River	2	INT	C	Y	Y	Y	147	122	0	N	343
4	Durham	A	ISTR-156-02	Trib. to Androscoggin River	1	INT	C	Y	Y	Y	103	169	0	N	346
4	Durham	A	ISTR-157-01	Trib. to House Brook	1.5	INT	B	Y	N	Y	134	434	0	Y	348
3	Farmington	D	PSTR-112-03	Wilson Stream	40	PER	C	Y	Y	Y	61	1075	47	N	247
4	Lewiston	A	PSTR-146-02	Trib. to Stetson Brook	4	PER	B	Y	N	Y	126	159	0	N	324
4	Lewiston	A	PSTR-147-01	Trib. to No Name Brook	3.5	PER	C	Y	Y	Y	120	643	0	Y	326, 327
4	Lewiston	A	PSTR-147-02	Stetson Brook	50	PER	B	Y	N	Y	107	1044	0	N	325
4	Lewiston	A	PSTR-148-01	Trib. to No Name Pond	3.5	PER	B	Y	Y	Y	164	464	0	Y	329
4	Lewiston	A	PSTR-148-02	Trib. to No Name Pond	4.5	PER	B	Y	Y	Y	230	491	0	Y	329
3	Chesterville	D	PSTR-114-05	Trib. to Wilson Stream	25	PER	B	Y	Y	Y	62	1526	218	Y	252
3	Chesterville	D	PSTR-114-07	Trib. to Wilson Stream	5	PER	B	Y	Y	Y	100	1041	220	Y	252, 253
4	Lewiston	A	PSTR-152-01	Trib. to No Name Brook	3	PER	B	Y	Y	Y	165	501	0	N	337
4	Auburn	A	PSTR-155-02	House Brook	8	PER	B	Y	Y	Y	160	502	0	N	345
4	Auburn/ Lewiston	A	PSTR-155-03	Androscoggin River	645	PER	C	Y	Y	Y	104	853	0	N	344
4	Auburn	A	PSTR-156-01	Trib. to Androscoggin River	2	PER	C	Y	Y	Y	254	141	0	N	345
4	Auburn	A	PSTR-156-03	Trib. to Androscoggin River	1	PER	C	Y	Y	Y	114	205	0	N	346
4	Auburn	A	PSTR-156-04	Trib. to Androscoggin River	2	PER	C	Y	Y	Y	264	74	0	Y	345
4	Auburn	A	PSTR-156-05	Trib. to Androscoggin River	2	PER	C	Y	Y	Y	142	57	0	N	346
4	Auburn	A	PSTR-156-06	Trib. to Androscoggin River	2	PER	C	Y	Y	Y	266	238	0	N	345
4	Auburn	A	PSTR-156-07	Trib. to Androscoggin River	2	PER	C	Y	Y	Y	213	136	0	N	346
4	Durham	A	PSTR-157-02	House Brook	2	PER	B	Y	Y	Y	110	531	0	Y	348
5	Windsor	B	ISTR-162-03	Trib. to West Branch Sheepscot River	2	INT	B	Y	Y	Y	247	262	0	N	417
3	Jay	D	PSTR-117-04	Fuller Brook	3	PER	B	Y	Y	Y	68	428	191	Y	260
5	Windsor	B	ISTR-162-05	Trib. to West Branch Sheepscot River	2	INT	B	Y	Y	Y	134	112	0	N	417
3	Jay	D	PSTR-121-04	Trib. to Clay Brook	3	PER	B	Y	N	Y	73	4212	0	Y	267, 268, 269

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
5	Windsor	B	ISTR-162-08	Trib. to West Branch Sheepscot River	2	INT	B	Y	Y	Y	1420	264	0	N	N/A
3	Livermore Falls	B	PSTR-122-03	Clay Brook/Redwater Brook	5	PER	B	Y	N	Y	62	1438	201	Y	270, 271
3	Livermore Falls	B	PSTR-125-03	Trib. to Androscoggin River	2	PER	C	Y	N	Y	54	588	68	Y	277, 278
5	Whitefield	B	ISTR-169-02	Trib. to East Branch Eastern River	2	INT	B	Y	Y	Y	292	58	0	N	402
5	Whitefield	B	ISTR-169-03	Trib. to East Branch Eastern River	2	INT	N/A	Y	Y	Y	168	366	0	Y	402
3	Leeds	B	PSTR-130-04	Dead River	60	PER	B	Y	N	Y	91	1337	168	N	289
3	Greene	A	PSTR-140-08	Trib. to Allen Pond	4	PER	B	Y	N	Y	94	281	0	Y	309
5	Whitefield	B	ISTR-173-01	Trib. to Sheepscot River	3	INT	N/A	Y	Y	Y	250	393	0	Y	392
5	Whitefield	B	ISTR-174-02	Trib. to Sheepscot River	3	INT	B	Y	Y	Y	147	366	0	Y	391
5	Whitefield	B	ISTR-174-04	Trib. to Sheepscot River	1	INT	B	Y	Y	Y	272	70	0	N	389
5	Whitefield	B	ISTR-175-01	Trib. to Sheepscot River	1	INT	N/A	Y	N	Y	124	327	0	Y	388
3	Greene	A	PSTR-143-01	Stetson Brook	6	PER	B	Y	N	Y	24	1202	326	Y	318
3	Lewiston	A	PSTR-145-01	Trib. to Stetson Brook	4	PER	C	Y	N	Y	8	3952	191	Y	321, 322, 323
3	Embden	D	PSTR-83-03	Alder Brook	35	PER	B	Y	N	Y	81	7136	1392	Y	183, 184
5	Wiscasset	B	ISTR-182-01	Trib. Ward Brook	4	INT	N/A	Y	Y	Y	247	121	0	N	373
3	Embden	D	PSTR-83-07	Trib. to Alder Brook	2.5	PER	B	Y	N	Y	95	1884	208	Y	183
3	Anson	D	PSTR-90-02	Carrabassett River	400	PER	B	Y	N	Y	33	1671	154	N	199, 200
5	Wiscasset	B	ISTR-184-01	Trib. to Montsweag Brook	1.5	INT	B	Y	Y	Y	140	346	0	N	369
5	Woolwich	B	ISTR-184-02	Trib. to Montsweag Brook	2.5	INT	N/A	Y	Y	Y	318	199	101	N	367
5	Woolwich	B	ISTR-184-03	Trib. To Montsweag Brook	150	INT	B	Y	Y	Y	113	97	97	N	367, 368
3	Anson	D	PSTR-93-01	Getchell Brook	15	PER	B	Y	Y	Y	59	1478	0	N	207, 208
5	Wiscasset	B	ISTR-184-05	Trib. to Montsweag Brook	3	INT	B	Y	Y	Y	167	31	0	N	369
5	Wiscasset	B	ISTR-184-06	Trib. to Montsweag Brook	2	INT	B	Y	Y	Y	191	102	0	N	369
3	Starks	D	PSTR-99-02	Trib. to Lemon Stream	6	PER	B	Y	Y	Y	65	1649	347	Y	219
3	Starks	D	PSTR-99-05	Lemon Stream	55	PER	B	Y	Y	Y	96	1506	63	N	219, 220

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
5	Woolwich	B	ISTR-185-02	Trib. to Montsweag Brook	2.5	INT	B	Y	Y	Y	130	115	115	N	366
4	Lewiston	A	PSTR-146-01	Trib. to Stetson Brook	4	PER	B	Y	N	Y	68	193	0	N	324
4	Lewiston	A	PSTR-149-01	No Name Brook	50	PER	B	Y	Y	Y	82	1119	0	N	330
4	Lewiston	A	PSTR-151-01	No Name Brook	25	PER	B	Y	Y	Y	83	928	0	N	334, 335
5	Woolwich	B	ISTR-185-06	Trib. to Montsweag Brook	3	INT	B	Y	Y	Y	204	107	0	N	N/A
5	Wiscasset	B	ISTR-186-01	Trib. to Chewonki Creek	4	INT	B	Y	Y	Y	4560	599	0	N	363
5	Wiscasset	B	ISTR-186-02	Trib. to Chewonki Creek	1	INT	B	Y	Y	Y	3279	123	0	N	364
5	Wiscasset	B	ISTR-186-03	Trib. to Chewonki Creek	1.5	INT	B	Y	Y	Y	2585	785	0	N	364
5	Wiscasset	B	ISTR-186-04	Trib. to Chewonki Creek	1.5	INT	B	Y	Y	Y	2763	333	0	N	364
5	Wiscasset	B	ISTR-186-05	Trib. to Montsweag Brook	1.5	INT	B	Y	Y	Y	1332	159	0	N	364, 365
5	Wiscasset/Woolwich	B	ISTR-186-06	Trib. to Montsweag Brook	1.5	INT	B	Y	Y	Y	283	193	0	N	365
5	Wiscasset	B	ISTR-186-07	Trib. to Montsweag Brook	3	INT	B	Y	Y	Y	1145	183	0	N	365
5	Wiscasset	B	ISTR-187-01	Trib. to Chewonki Creek	2.5	INT	B	Y	Y	Y	5206	176	0	N	363
5	Wiscasset	B	ISTR-187-02	Trib. to Chewonki Creek	1.5	INT	B	Y	Y	Y	5215	163	0	N	363
5	Wiscasset	B	ISTR-187-03	Trib. to Chewonki Creek	1.5	INT	B	Y	Y	Y	5255	68	0	N	363
5	Wiscasset	B	ISTR-187-04	Trib. to Chewonki Creek	5	INT	B	Y	Y	Y	5067	104	0	N	363
5	Wiscasset	B	ISTR-187-05	Trib. to Chewonki Creek	1	INT	B	Y	Y	Y	5676	351	0	N	362, 363
5	Wiscasset	B	ISTR-187-06	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	7230	103	0	N	362
5	Wiscasset	B	ISTR-187-07	Trib. to Chewonki Creek	1	INT	B	Y	Y	Y	6071	496	0	N	362
5	Wiscasset	B	ISTR-187-08	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6585	80	0	N	362
5	Wiscasset	B	ISTR-187-09	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6697	42	0	N	362
5	Wiscasset	B	ISTR-187-10	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6575	154	0	N	362
5	Wiscasset	B	ISTR-187-11	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6454	474	0	Y	362
5	Wiscasset	B	ISTR-187-12	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6364	185	0	N	362
5	Wiscasset	B	ISTR-187-13	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6601	170	0	N	362

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[8]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
5	Wiscasset	B	ISTR-187-14	Trib. to Chewonki Creek	2	INT	B	Y	Y	Y	6875	184	0	N	362
5	Wiscasset	B	ISTR-187-15	Trib. to Back River/ Monstsweag Bay	1	INT	B	Y	Y	Y	9418	341	0	N	361
5	Wiscasset	B	ISTR-187-16	Trib. to Back River/ Monstsweag Bay	1	INT	B	Y	Y	Y	9274	168	0	N	361
5	Wiscasset	B	ISTR-187-17	Trib. to Back River/ Monstsweag Bay	1	INT	B	Y	Y	Y	9292	35	0	N	361
5	Wiscasset	B	ISTR-187-18	Trib. to Back River/ Monstsweag Bay	1	INT	B	Y	Y	Y	9271	8	0	N	361
5	Wiscasset	B	ISTR-187-20	Trib. to Chewonki Creek	1.5	INT	B	Y	Y	Y	8412	23	0	N	361
5	Wiscasset	B	ISTR-187-21	Trib. to Chewonki Creek	1.5	INT	B	Y	Y	Y	8399	228	0	N	361
5	Wiscasset	B	ISTR-187-22	Trib. to Chewonki Creek	1	INT	B	Y	Y	Y	6527	340	0	N	362
5	Wiscasset	B	ISTR-187-23	Trib. to Back River/ Monstsweag Bay	2.5	INT	B	Y	Y	Y	9725	511	0	N	361
5	Wiscasset	B	ISTR-188-01	Trib. to Back River/ Monstweag Bay	3	INT	B	Y	Y	Y	14503	270	0	N	359
5	Wiscasset	B	ISTR-188-02	Trib. to Back River/ Monstsweag Bay	2	INT	B	Y	Y	Y	13559	30	0	N	359
5	Wiscasset	B	ISTR-188-03	Trib. to Back River/ Monstsweag Bay	2	INT	B	Y	Y	Y	12507	170	0	N	359, 360
5	Wiscasset	B	ISTR-188-05	Trib. to Back River/ Monstsweag Bay	1	INT	B	Y	Y	Y	10626	250	0	N	360
5	Wiscasset	B	ISTR-188-06	Trib. to Back River/ Monstsweag Bay	1	INT	B	Y	Y	Y	10637	24	0	N	360
5	Wiscasset	B	ISTR-188-07	Trib. to Back River/ Monstsweag Bay	2	INT	B	Y	Y	Y	13617	81	0	N	359
5	Wiscasset	B	ISTR-188-08	Trib. to Back River/ Monstsweag Bay	3	INT	B	Y	Y	Y	11884	70	0	N	360
5	Wiscasset	B	ISTR-188-09	Trib. to Back River/Monstweag Bay	3	INT	B	Y	Y	Y	14398	348	0	N	359
5	Windsor	B	PSTR-162-01	Trib. to West Branch Sheepscot River	8	PER	B	Y	Y	Y	265	1660	0	N	417
5	Windsor	B	PSTR-162-02	Trib. to West Branch Sheepscot River	2	PER	B	Y	Y	Y	119	148	0	N	417
5	Windsor	B	PSTR-162-06	Trib. to West Branch of Sheepscot River	1.5	PER	B	Y	Y	Y	1335	288	0	N	N/A
5	Windsor	B	PSTR-162-09	Trib. to West Branch Sheepscot River	3	PER	B	Y	Y	Y	74	3120	0	N	416, 417
5	Windsor	B	PSTR-162-12	Trib. to West Branch Sheepscot River	40	PER	B	Y	Y	Y	181	770	0	N	416
5	Windsor	B	PSTR-162-13	Trib. to West Branch Sheepscot River	1.5	PER	B	Y	Y	Y	778	599	0	N	417
5	Windsor	B	PSTR-163-01	Trib. to West Branch Sheepscot River	40	PER	AA	Y	Y	Y	96	113	0	N	415
5	Windsor	B	PSTR-163-02	West Branch Sheepscot River	40	PER	AA	Y	Y	Y	51	6684	34	N	414, 415, 416

Exhibit G: NECEC Atlantic Salmon Waterbody Crossing Table

Segment	Town	MDIFW Region	Feature ID	Stream Name[1]	Ave. Stream Width[2] (ft)	Stream Type[3] (PER/INT)	State Water Quality Classification[4]	Atlantic Salmon GOM DPS[5a] (Y/N)	HUC-10 Watershed Designated as Atlantic Salmon Critical Habitat[5b] (Y/N)	100 Foot Buffer[6] (Y/N)	Nearest New Structure Location (ft)	Streams within CMP Controlled Land (Linear Feet)[7]	Permanent Forested Conversion Impact to Streams (Linear Feet)[9]	Temp. Equipment Crossing[9] (Y/N)	Natural Resource Map/Sheet Number
5	Whitefield	B	PSTR-166-02	Finn Brook	5	PER	A	Y	Y	Y	294	320	0	N	408
5	Whitefield	B	PSTR-168-01	East Branch Eastern River	11	PER	B	Y	Y	Y	189	360	0	N	403
5	Whitefield	B	PSTR-168-02	East Branch Eastern River	3	PER	B	Y	Y	Y	58	728	0	Y	403
5	Whitefield	B	PSTR-169-01	East Branch Eastern River	5	PER	B	Y	Y	Y	134	582	0	Y	402
5	Whitefield	B	PSTR-170-01	East Branch Eastern River	9	PER	B	Y	Y	Y	172	436	0	Y	399, 400
5	Whitefield	B	PSTR-171-01	Trib. to Sheespcot River	40	PER	B	Y	Y	Y	302	388	0	Y	397
5	Whitefield	B	PSTR-172-01	Trib. to Sheepscot River	6	PER	B	Y	Y	Y	93	669	0	N	394
5	Whitefield	B	PSTR-172-02	Trib. to Sheespcot River	20	PER	B	Y	Y	Y	80	1819	0	N	395
5	Whitefield	B	PSTR-172-03	Trib. to Sheepscot River	2	PER	N/A	Y	Y	Y	302	80	0	N	396
5	Whitefield	B	PSTR-174-01	Trib. to Sheepscot River	6	PER	B	Y	Y	Y	186	359	0	Y	391
5	Whitefield	B	PSTR-174-03	Trib. to Sheepscot River	7	PER	B	Y	Y	Y	219	308	0	Y	389
5	Whitefield	B	PSTR-175-02	Trib. to Sheepscot River	3	PER	B	Y	Y	Y	164	378	0	Y	388
5	Alna	B	PSTR-176-01	Trib. to Sheepscot River	5	PER	B	Y	Y	Y	196	396	0	Y	387
5	Alna	B	PSTR-177-01	Trib. to Trout Brook	25	PER	B	Y	Y	Y	18	573	0	N	383
5	Alna	B	PSTR-178-01	Trout Brook	8	PER	A	Y	Y	Y	77	412	0	N	381, 382
5	Alna	B	PSTR-178-02	Trout Brook	15	PER	A	Y	Y	Y	43	2323	0	N	381, 382
5	Alna	B	PSTR-179-02	Trib. to Trout Brook	6	PER	B	Y	Y	Y	95	1204	0	Y	379, 380
5	Alna	B	PSTR-179-03	Trib. to Trout Brook	6	PER	B	Y	Y	Y	131	375	0	N	379
5	Wiscasset	B	PSTR-183-02	Trib. to Montsweag Brook	0.5	PER	B	Y	Y	Y	39	1152	0	Y	370
5	Wiscasset	B	PSTR-184-08	Montsweag Brook	25	PER	B	Y	Y	Y	182	158	0	N	369
5	Woolwich	B	PSTR-185-01	Trib. to Montsweag Brook	9.5	PER	B	Y	Y	Y	74	1108	0	N	365
5	Wiscasset/Woolwich	B	PSTR-186-08	Montsweag Brook	17.5	PER	B	Y	Y	Y	238	1236	0	Y	365
5	Wiscasset	B	PSTR-187-19	Trib. to Chewonki Creek	1.5	PER	B	Y	Y	Y	8373	146	0	N	361
5	Wiscasset	B	PSTR-187-24	Trib. to Chewonki Creek	1.5	PER	B	Y	Y	Y	7917	787	0	N	361, 362
5	Wiscasset	B	PSTR-188-04	Trib. to Back River/ Monstsweag Bay	1	PER	B	Y	Y	Y	11480	563	0	N	360

EXHIBIT H: RARE PLANT SURVEY NARRATIVE REPORT

Rare Plants Survey Narrative Report

Central Maine Power
New England Clean Energy Connect

September 2018

Prepared for:

Central Maine Power Co.
83 Edison Drive
Augusta, ME 04336

Prepared by:

Tetra Tech, Inc.
451 Presumpscot Street
Portland, ME 04103

And

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1.0 INTRODUCTION

Central Maine Power Company's (CMP's) New England Clean Energy Connect (NECEC) Project will entail the construction of a new transmission line, associated converter station, new and upgraded substations and infrastructure in northern and western Maine. The NECEC Project (Project) is proposed to cross and parallel existing transmission rights-of-way (ROWs), as well as create a new ROW (greenfield corridor), in western Maine. This includes areas in multiple municipalities and areas under Land Use Planning Commission (LUPC) jurisdiction from Beattie Township to Lewiston, to Pownal, and from Windsor to Wiscasset. Tetra Tech, in combination with TRC, was contracted by CMP to conduct a survey for Rare, Threatened, or Endangered (RTE) plant species and rare exemplary natural communities along the Project's proposed ROW, in support of its permit application.

Surveys were conducted in July 2018. This document provides a narrative description to accompany all rare plant and rare exemplary natural community findings for the Project.

1.1 BACKGROUND

CMP's NECEC Project will consist of five segments that span multiple counties and townships in central and northwestern Maine. The Project parallels an existing line north from Larrabee substation in Lewiston until it reaches the northern end of Moxie Lake, the southeast point of Segment 1, at which point the route turns west-northwest, and the proposed new ROW is located in greenfield to the Quebec, Canada border (Figure 1).

Segments 4, 5, and the southern half of Segment 3 were surveyed previously in connection with CMP'S Maine Power Reliability Program (MPRP) in the 2007 to2009 time frame, and CMP and Maine Natural Areas Program (MNAP) have agreed that these past survey efforts were sufficient for general rare plant surveys (CMP 2018). The decision was made, however, to perform new targeted surveys in areas in Segment 3 where MNAP modeling results predicted the potential presence of small-whorled pogonia (*Isotria medeoloides*). Repeating the survey search effort in these areas was deemed appropriate due to the annual variation in visible plant occurrences. Additionally, the previously identified rare plants and communities were revisited to assess current population and community conditions.

There are three plant species in Maine that are federally listed under the Endangered Species Act (ESA). Of these, only one was identified as having the potential to occur within the Project area. The official species list, obtained through the Environmental Conservation Online System – Information Planning and Consultation (ECOS-IPAC) website, identified small-whorled pogonia, a federally listed threatened orchid, as potentially occurring within the boundaries of the NECEC Project (CMP 2018). In addition to federally listed species, rare plants and rare natural communities, as identified by MNAP, are known to, or have the potential to, occur along the Project route.

1.2 PREVIOUSLY KNOWN OCCURRENCES

Previous surveys along the route identified five rare plant populations and two rare natural communities in Segments 3 and 4. These rare plant populations include a population of dry land

sedge (*Carex siccata)* on the north side of the Androscoggin River (at the north end of Segment 4) and, on Segment 3, a small population of fall fimbry (*Fimbristylis autumnalis*) near the Town of Jay, a small population of wild leek (*Allium tricoccum*) on the south side of the Carrabassett River in Anson, a moderate to large population of red-stemmed gentian (*Gentiana rubricaulis*) in Concord, and a moderate population of long-leaved bluet (*Houstonia longifolia*) at the north end of Segment 3 in Moscow. The two rare natural communities were originally identified as an Enriched Hardwood Forest (Maple-Basswood-Ash Forest) along the Androscoggin River in Livermore Falls and a Hardwood River Terrace Forest (Upper Floodplain Hardwood Forest) along the north side of the Carrabassett River in Anson.

No rare plants or exemplary natural communities were previously identified along Segment 1.

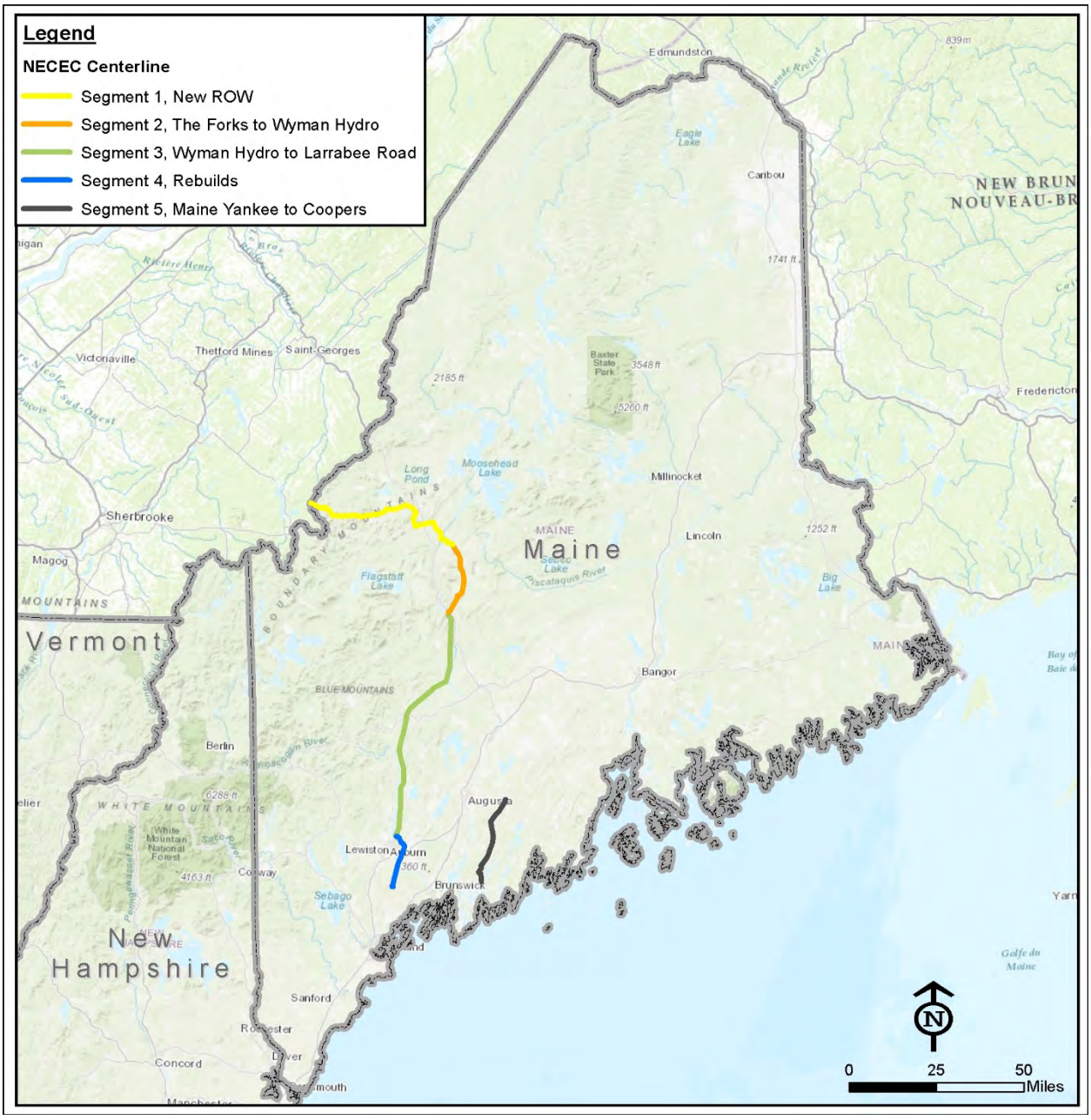


Figure 1. Overview Map of NECEC Project Location and Project Segments

2.0 METHODS

Prior to this work, a desktop Landscape Analysis was conducted by Burns & McDonnell to determine potential locations for rare plant occurrences (CMP 2018). This analysis utilized physical, geographical, and biological information to prioritize search areas. Additional random search areas were identified to account for those areas of the Project not selected as target sample areas. Agency-provided modeling was used in conjunction with the Landscape Analysis on Segment 3, between Jay and Lewiston for small-whorled pogonia surveys (as agreed by MNAP and U.S. Fish and Wildlife Service [USFWS]; CMP 2018). The results of the Landscape Analysis were provided to the plant survey teams, with survey sections ranging from 0.1 mile to 3 miles in length.

2.1 PLANT SURVEY

Surveys for target plant species and rare exemplary natural communities were led by botanists Art Gilman, Duane Choquette, and Mao Lin, each assisted by a field biologist. Plant surveys were conducted during July 2018.

Survey teams searched for plant species that were listed as S1, S2, or S3 by MNAP. These state rankings cover plants that are "rare in Maine" to "critically imperiled in Maine" (See Table 1 for a list of state rankings and their definitions). In addition to state-listed species, the federally listed threatened small-whorled pogonia was actively targeted using a detailed search protocol as described by MNAP (CMP 2018, Appendix E). Two teams surveyed the Project area, one starting from the southern end, the other from the northern end. Surveys for each identified survey area consisted of meander surveys along one side of the ROW and then back down the other side of the ROW, such that surveys ended at the same location they started from.

Table 1. State Rarity Ranks (MNAP)

State Rank	Status
S1	Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
S2	Imperiled in Maine because of rarity (6–20 occurrences or few remaining individual acres) or because of other factors making it vulnerable to further decline.
S3	Rare in Maine (20–100 occurrences),
S4	Apparently secure in Maine.
S5	Demonstrably secure in Maine.
SH	Known historically from the state, not verified in the past 20 years.
SX	Apparently extirpated from the state, loss of last known occurrence has been documented.
SU	Under consideration for assigning rarity status; more information needed on threats or distribution.
S#?	Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

1/ Definitions from the MNAP website (MNAP 2018a)

For areas identified as potential small-whorled pogonia habitat, survey efforts were intensified per the MNAP protocol to account for potential plant and habitat areas. Space between meanders was reduced and teams used walking sticks to move ferns and other vegetation aside to look for potential plants. Where similar woodland whorled-leaved plants existed (i.e. star flower [*Trientalis borealis*], Indian cucumber [*Medeola virginiana*], whorled wood aster [*Oclemena acuminate*], etc.), surveyors walked close enough to positively identify the plants before moving on. Areas with greater potential to contain the plants (Appendix E) were searched more intensively.

2.2 ECOLOGICAL COMMUNITIES

MNAP has classified 104 natural community types across Maine, with each assigned a rarity rank between S1 (rare) and S5 (common). For this survey, rare communities were considered those ranked as S1 through S3. Ranking definitions for communities are the same as those for species (Table 1).

Much of the areas surveyed were in matrix forest lands. In the southern portions of the Project area (Segments 3 and 4), this was dominated by Early Successional Forests and Oak-Pine Forests. The search areas in these segments were within the forested locations and the existing powerline ROW, which is in a managed state of meadow/shrubland condition. In Segment 2, search areas contained more eastern hemlock (*Tsuga canadensis*) and northern white cedar (*Thuja occidentalis*), and some areas were dominated wetlands or by acid fen habitats. Segment 1 included a large amount of cut-over forest land with clear-cuts, pine (*Pinus spp.*), and spruce (*Picea spp.*) plantations, and areas in regeneration, primarily Lower-elevation Spruce – Fir Forest and Spruce-Northern Hardwood Forest.

3.0 RESULTS

The following section summarizes the results and observations from the rare plant species and rare exemplary natural community surveys. A map of the Project location is provided in Appendix A. Maps of all documented rare plant populations and rare natural communities are provided in Appendix B. Photographic documentation is provided in Appendix C and field data are provided in Appendix D. The Landscape Analysis and Field Survey Protocol for small-whorled pogonia is provided in Appendix E.

During the July 2018 rare plant and natural community surveys for CMP, 11 populations of 8 rare plant species, and 6 occurrences of three rare exemplary natural communities were identified (Tables 2 and 3, respectively).

Table 2. Rare Plant Populations Identified During July 2018 Rare Plant Surveys

State Rank	Scientific Species Name	Common Species Name	Number of Populations
S1	*Isotria medeoloides*[1/]	Small-whorled pogonia	1
S1	*Gentiana rubricaulis*	Red-stemmed gentian	2
S2	*Carex siccata*	Dry land sedge	1
S2	*Galium kamtschaticum*	Boreal bedstraw	3
S2	*Dryopteris goldiana*	Goldie's wood fern	1
S2S3	*Houstonia longifolia*	Long-leaved bluet	1
S3	*Trichophorum clintonii*	Clinton's bulrush	1
SH	*Lindernia dubia* var. *anagallidea*	Slender false pimpernel	1

1/ *Isotria medeoloides* is federally listed as "threatened" under the ESA

Table 3. Rare Exemplary Natural Communities Identified During July 2018 Rare Plant Surveys

State Rank	Scientific Community Name	Common Community Name	Number of Occurrences
S1	Jack Pine Forest	Jack Pine Forest	3
S3	Hardwood River Terrace Forest	Upper Floodplain Hardwood Forest	2
S3	Maple-Basswood-Ash Forest	Enriched Northern Hardwood	1

3.1 RARE PLANTS

The rare plant surveys were conducted to identify and document occurrences of plants that were considered rare within the state of Maine, with an S1, S2, or S3 ranking. Only one federal ESA-listed (Threatened) species was known to potentially occur within the Project area: small-whorled pogonia (*Isotria medeoloides*). Another federal ESA-listed (Threatened) orchid, the eastern prairie fringed orchid (*Platanthera leucophaea*), is known from one location in northern Maine. While not anticipated to occur in the survey areas, surveyors were aware and confirmed identifications of other similar-looking species.

Two of the previously identified plant populations were not able to be located during revisit surveys: the wild leek and the fall fimbry. In total, 11 populations of rare species were either newly identified or confirmed along the Project route. A brief description of their occurrences is provided below. Additional information, including photographs and field data is found in the photologs (Appendix C) and field data forms (Appendix D). A summary table of results is provided in Appendix F.

3.1.1 Small-Whorled Pogonia (*Isotria medeoloides*)

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, typically 5 (though may also be 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 is ranked S1 and has been documented in five counties in Maine: Androscoggin, Cumberland, Kennebec, Oxford, and York (MNAP 2018b). Small-whorled pogonia is federally listed as threatened under the federal ESA.

Small-whorled pogonia
Photo Credit: Ritchie 2018

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, ME (Appendix B, Sheet-12); just west of the proposed Project clearing limits (approximately 12 feet from the boundary, as identified by GPS). The plant was growing on a relatively steep northeast-facing embankment of a small intermittent stream within an Oak-Pine Forest community; the most closely associated trees were hemlock and red oak (*Quercus rubra*), with yellow birch (*Betula alleghaniensis*) and red maple (*Acer rubrum*) present to a lesser extent. There was no groundcover vegetation within 2 feet of the plant and the ground was covered with a moderately thick layer of deciduous and conifer leaf and twig/branchlet litter. This location is approximately 80 feet from the existing powerline ROW clearing.

3.1.2 Red-Stemmed Gentian (*Gentiana rubricaulis)*

Red-stemmed gentian is a wetland plant more commonly found around the Great Lakes, where it inhabits natural prairie habitats. It is known in the northeast from New Brunswick, Canada, and two counties in Maine: Kennebec and Somerset (MNAP 2018b).

Red-stemmed gentian

Photo credit: Ritchie 2018

Two populations were identified in the Project Area. Both populations were only in-leaf, as the species flowers in August and September; later than the search effort. One population was a previously identified population in Segment 3, in Concord, near Bingham, ME (Appendix B, Sheet-9). This population was entirely within the existing cleared powerline ROW, with some plants near the edge of the forest clearing. Its estimated population size was 150 individuals. The second population was a new population, identified in Segment 2, near Moscow, ME (Appendix B, Sheet-7). Both populations are in Somerset County and found within the existing ROW clearing. However, the second population was present both along the edges of a shallow wetland and into the forest edge of a young northern white cedar swamp. The estimated population size was approximately 300 individuals. In both location, plants appeared to prefer the damp margins of the wetlands and adjacent uplands, rather than areas that may be seasonally inundated in the wetland centers, and tended to grow where herb cover was not greater than 2 feet in height.

Plants were not in flower and were identified by their distinctive vegetative characteristics (e.g., semi-clasping, opposite leaves and smooth glabrous stems); plants at the Concord site were observed in flower in 2007 by Gilman. Both populations consist of randomly rather sparsely scattered individuals. In this species, plants are biennial and typically form single stems, with some few plants having two to four stems. Non-flowering, first-year seedlings are no doubt present but could not be identified or counted, due to lack of identifying characteristics and visibility; the overall population therefore probably is twice the estimate given.

3.1.3 Dry Land Sedge (*Carex siccata*)

This species is generally found in dry sandy soils in open to lightly shaded areas. Dryland sedge is an erect, clonal (patch-forming) sedge with both clump and single stem growth habits, generally between 15 and 20 cm tall. In Maine, it has been found in dry, old fields in early stages of succession (MNAP 2018b). It is documented in six counties in Maine: Androscoggin, Cumberland, Oxford, Sagadahoc, and York.

The Lewiston population was a previously identified in 2007, at the northern end of Segment 4. The location is at the edge of a corn field, between the margin of cultivation and the Androscoggin River (Appendix B, Sheet-13). The population exists wholly within the existing powerline ROW, and consists of two distinct groupings along the river terrace. The individuals were in leaf and fruiting reproductive stages, but were moderately suppressed due to competition with other herbaceous plants and some shrubs.

Dry-land sedge
Photo credit: Ritchie 2018

3.1.4 Boreal Bedstraw *(Galium kamtschaticum)*

Boreal bedstraw is perennial herb found in cool woods, thickets and along streambanks and is known to occur in rich woods in Maine. It is considered rare in Maine as it is at the southern extent of its range. Boreal bedstraw has been documented in four counties in Maine: Franklin, Piscataquis, Oxford, and Somerset (MNAP 2018b)

The plant was identified in three distinct populations at the northern extent of the Project areas, in Segment 1 (Appendix B, Sheet-1). The populations ranged from large to small in size, all found within the Appleton Township in Somerset County. The populations were situated on the northern slope of Tumbledown Mountain between 2,200 and 2,300 feet in elevation. All three populations were found on old logging roads in northern hardwood forests that have previously undergone timber harvest. The

Boreal bedstraw
Photo credit: Choquette 2018

current regenerating forest structure consisted of sugar maple (*Acer saccharum*) dominant canopy with trees ranging from 6 to 12 inches in diameter.

The easternmost population was located within a small forested wetland on an overgrown logging road. The plants were found growing on the edge of a moose trail, intermixed with common jewelweed (*Impatiens capensis*), enchanter's nightshade (*Circaea lutetiana*), and marsh bedstraw (*Galium palustre*). This large population contained over 500 individual plants, all with a vigorous growth habit and displaying flowers and fruit.

The other two populations were separated by approximately 25 feet and located at the intersection of two logging roads where a hillside seep provides hydrology to the old road bed, resulting in a small forested wetland community. A logging clear-cut within the early stages of regeneration was located less than 50 feet to the west of these populations. The wetland is wetter than the previous location, and supports a dense herbaceous sedge community, with the boreal bedstraw found amongst gaps in the sedges along with jewelweed and interrupted fern (*Osmunda claytoniana*). These two populations combined were smaller than the easternmost population with 16 and 85 individuals respectively. These populations also displayed vigorous growth habit along with flowers and fruit.

3.1.5 Goldie's Wood Fern (*Dryopteris goldiana*)

Goldie's wood fern is a large wood fern, generally found in enriched moist woodland habitats, usually in hilly or mountainous terrain. It is found from southeastern Canada, south to the Carolinas and west to Minnesota. Diagnostic features include circular sori (spore-producing regions on fertile fronds) that are located along the mid-vein of each secondary leaflet (pinnule), narrow dark scales at the base of each stalk, and fronds that are parallel-sided and narrow abruptly at the tip. This species is documented in seven counties in Maine; Aroostook, Franklin, Kennebec, Oxford, Penobscot, Piscataquis, Somerset.

Goldie's fern
Photo credit: Ritchie 2018

A single plant with six crowns was identified on Segment 2 in Moscow in Somerset County (Appendix B, Sheet-5). This small population was located in an enriched inclusion of wetland in otherwise upland deciduous forest, along a former logging road/drainage. This wetland/enriched forest habitat has a dark, organic loamy soil and included wetland species such as common jewelweed and sensitive fern (*Onoclea sensibilis*). Yellow birch was common immediately around the location where the Goldie's wood fern was found. This area was parallel to the open habitat of the existing powerline ROW and is quite small and limited to this one drainage-way; there appears to be no other suitable habitat nearby.

3.1.6 Long-leaved Bluet (*Houstonia longifolia*)

Long-leaved bluet is a small herbaceous perennial plant with a small, four-petaled, white flower. It can be found on rocky ledges or river shore gravels that are not strongly acidic, and is usually found growing in small ledge crevices or depressions. Maine populations tend to be small but persistent. The plant is documented in six counties: Cumberland, Kennebec, Penobscot, Piscataquis, Sagadahoc, and Somerset (MNAP 2018b). It is rare in Maine due to being at the northern limit of its range

Long-leaved bluet
Photo credit: Ritchie 2018

This population was previously identified during a survey in 2008. It is located on an elevated river terrace, just downstream from Wyman Dam (Appendix B, Sheet-8). The population is dispersed across a relatively large, semi-bare gravel area within the existing powerline ROW clearing. The population is of moderate size and vigor. The survey botanist indicated that the population was substantially reduced from previous visits, finding only one patch of plants with the high vigor previously observed. Plants were in leaf and flower at the time of the survey. Lichens appeared to be the dominant competing groundcover.

3.1.7 Clinton's Bulrush (*Trichophorum clintonii)*

Clinton's bulrush is a relatively low-growing sedge with solitary terminal spikelets. It can be found growing in diverse conditions; from dry or springy ledges, gravel or open woods and turfy shores. In Maine, it has been found growing on calcareous ledgy shores (MNAP 2018b) and has been documented from five counties: Aroostook, Kennebec, Penobscot, Piscataquis, and Somerset. It is considered rare in Maine as it is at the southern limit of its range.

Clinton's bulrush
Photo credit: Gilman 2018

A small population was identified approximately 0.1-mile upslope from an actively eroding Chase Stream (Appendix B, Sheet-6). The erosion was significant, resulting in very high mobile banks. This population was found within the existing powerline ROW clearing, mostly growing underneath a stand of bracken fern (*Pteridium spp.*), and co-occurring with bunchberry dogwood (*Cornus canadensis*). Some clumps were also found growing within the sandy ROW access road.

3.1.8 Slender False Pimpernel *(Lindernia dubia* var*. anagallidea)*

Although the species *Lindernia dubia* is common in Maine, this variety, *anagallidea*, was historically only identified in one location in Maine; a damp, abandoned gravel pit in York County (MNAP 2018b). This annual herbaceous plant is generally found in open wet areas, though not along the coast or rivers, and can include old fields and roadsides (MNAP 2018b). Its distribution ranges from Florida to Maine, and westward to Washington State. It's considered rare in Maine, due to being at the northern limit of its range.

Lindernia dubia var. anagallidea
Photo credit: Gilman 2018

A small, very limited population of the slender false pimpernel was identified near the town of Jay, ME (Appendix B, Sheet-14). It was observed near an abandoned gravel pit along the existing powerline ROW. The available habitat was extremely limited; within a small, shallowly puddled area on the floor of the former gravel pit, surrounded by sparsely vegetated, level, dry, gravelly terrain. The population was small, consisting of 15 to 20 small individuals of less than normal vigor. Plants were in different stages of maturity; from in-leaf to mature fruit and seed dispersing. Associated plant species include poverty rush (*Juncus tenuis*) and slender false foxglove (*Agalinis tenuifolia*).

3.2 NATURAL COMMUNITIES

The MNAP designates rare natural community types within the state of Maine. Two rare natural communities were identified during previous surveys of part of the route. During revisits, these communities were re-assessed. A previously identified Enriched Northern Hardwood Forest, was reclassified as a Hardwood River Terrace Forest, after resurveys. A total of six occurrences of three rare exemplary natural community types were identified during the 2018 surveys; three Jack Pine Forests, two Hardwood River Terrace Forests, and one Enriched Northern Hardwood Forest. Below, is presented a brief description of each identified rare natural community. Additional information is provided in the photologs (Appendix C) and field data forms (Appendix D).

3.2.1 Jack Pine Forest

Jack Pine Forest – Bradstreet Township
Photo credit: Choquette 2018

The MNAP (2018c) describes a Jack Pine Forest as a closed canopy forest dominated by jack pine (*Pinus banksiana*). Black spruce (*Picea mariana*) or red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) are common, comprising up to 20 percent cover, and red pine (*Pinus resinosa*) may be present in some areas as well. Although plants in the understory and herbaceous layers are limited, and the bryoid layer is well developed, lowbush blueberry (*Vaccinium angustifolium*) and herbs such as bunchberry and Canada mayflower (*Maianthemum canadense*) are typically present. In Maine, disturbance such as clear-cuts or fire are needed to stimulate seed germination, Jack Pine Forests. Without disturbance these forests would eventually succeed to spruce and fir (MNAP 2018c).

This natural community was identified in three distinct forest stands at the northern extent of the Project areas in Segment 1, all found within the Bradstreet Township in Somerset County.

Two of the Jack Pine Forest stands were located in the same general area northwest of Egg Pond, and east of Bitter Brook. The two stands were separated by a regenerating logging cut, and were likely one contiguous community prior to the logging activities (Appendix B, Sheet-2). The stands abutted regenerating clear-cuts to the north, east and west, which were dominated by young red spruce, though scattered young jack pines were found throughout. Both Jack Pine Forest stands extended southward outside of the study corridor, where they transitioned into a black spruce bog community. These two Jack Pine Forest stands were predominately jack pine (90 percent dominant), with mixed white pine (*Pinus strobus*), red pine and red spruce in the canopy. The understory was dry and open, with lowbush blueberries, laurels (*Laurus spp.*), and snowberries (*Symphoricarpos spp*.) found sporadically in patches, and bracken fern present in areas where the canopy thins. Soils were shallow and rocky, with a thin organic layer on top of a sandy mineral soil.

The third Jack Pine Forest stand was located on triangular swath of habitat bounded on the southern side by a spruce/fir forest bordering Spencer Road, the northwestern side by Horse Brook and on the northeastern side by an unnamed tributary of Horse Brook (Appendix B, Sheet-3). The Jack Pine Forest is fairly large, extending outside of the survey area to the north. The south side abutted a mixed spruce and fir forest. Sugar maples saplings appear sporadically in the understory in the western edge of the Jack Pine Forest near Horse Brook. The Jack Pine Forest also spans a large alder-dominant stream valley and two smaller wetland seeps. This Jack Pine Forest stand was predominately jack pine (70 percent dominant), with mixed red pine, red spruce, and balsam fir in

the canopy. The understory is dry and open, with bracken fern and bunchberry found throughout. Soils were deep and sandy with a thin organic layer on top.

3.2.2 Hardwood River Terrace Forest

Hardwood River Terrace Forest communities occur on slightly elevated terraces of low-gradient rivers, with occasional flooding. Soils are fine sand or silt and of relatively high nutrient levels. The canopy is almost complete, and dominated by sugar maple, red oak, or yellow birch. The understory is generally open with few shrubs, and a lush herb layer is usually present (including spring ephemerals) with few mosses. (MNAP 2018c).

Hardwood River Terrace Forest – Livermore Falls
Photo credit: Gilman 2018

Two communities of this type were observed during the July 2018 surveys, one near Livermore Falls, ME, along the Androscoggin River (Appendix B, Sheet-11), and the other along the Carrabassett River near North Anson (Appendix B, Sheet-10).

The community along the Androscoggin River, near Livermore Falls, was a small patch community within a large floodplain forest community. This small patch was distinctive in the size and make-up of the overstory vegetation; consisting of red oak, swamp birch (*Betula pumila*), red maple, and at least one butternut (*Juglans cinerea*), and conspicuously lacking silver maple (*Acer saccharinum*) or cottonwoods (*Populus spp*.). The understory was generally sparse, and the herbaceous layer was dominated by ferns, such as ostrich fern (*Matteuccia struthiopteris*), interrupted fern, lady fern (*Athyrium filix-femina*), and sensitive fern.

The community observed in North Anson was on the north side of the Carrabassett River at a site near its confluence with the Kennebec River and would rarely be subject to back-flooding from the River. This community is a patch on uneven terrain (i.e., old back-channels combined with gently sloping land), that lies between a narrow strip of silver maples (at the stream margin) and cultivated lands. The forest community is of relatively young age (many trees less than 10 inches in diameter) and is dominated by green ash (*Fraxinus pennsylvanica*), red oak, and American elm (*Ulmus americana*). There is an understory (increasing since first observed in 2007) of non-native shrubs, such as Asian honeysuckles (*Lonicera spp*.) and multiflora rose (*Rosa multiflora*). No plant species indicative of particularly enriched soil conditions were observed (e.g., no wild leek, northern maidenhair fern [*Adiantum pedatum*], etc.), and forest health appears somewhat compromised.

3.2.3 Enriched Northern Hardwood Forest

Enriched Northern Hardwood Forest – Moxie Road
Photo credit: Ritchie 2018

Enriched Northern Hardwood Forests occur throughout much of Maine. They are often small patches, occurring within larger matrix northern hardwood forests. They are closed-canopy hardwood forests, often dominated by sugar maple, with beech (*Fagus grandifolia*) or yellow birch subordinate. The understory vegetation is generally lacking, being mostly made up of saplings of the canopy trees. Ironwood (*Carpinus caroliniana*), basswood (*Tilia americana*), and ash (*Fraxinus spp.*) are generally present, though basswood may be absent in northern Maine (MNAP 2018c). Herbaceous plants that are indicative of this community include northern maidenhair fern, silvery spleenwort (*Desparia acrostichoides*), blue cohosh (*Caulophyllum thalictroides*), Christmas fern (*Polystichum acrostichoides*), Dutchman's breeches (*Dicentra cucullaria*), etc. These communities occur on concave hillsides, ravines, stream drainages, or slope bases where nutrients accumulate, with slopes ranging from moderate to flat.

The Enriched Northern Hardwood Forest identified during the surveys occurs on a gentle north-facing slope, south of Moxie Stream, in Somerset County, ME (Appendix B, Sheet-4). This forest community is dominated by sugar maple with a strong ash and yellow birch component. Ironwood and elm were present as well as the occasional basswood. Temporary drainages threaded throughout the site, with visible flow-paths present, but no dedicated streambanks. The soils ranged from a rich silty loam to sandy loam. Northern maidenhair fern was prevalent within the community, forming distinct patches. Silvery spleenwort was also common throughout the site. Other herbaceous plants occurring in this community are Christmas fern, common jewelweed (in wetter areas), dwarf enchanter's nightshade (*Circaea alpine*), baneberry (*Actaea pachypoda, Actaea racemose*), sarsaparilla (*Aralia nudicaulis*), and ostrich fern, among others.

Evidence of past harvest was present in the form of decaying stumps. Trees ranged from sapling to mature, though trees rarely exceeded 2 feet in diameter. Many young saplings made up the majority of the understory.

4.0 DISCUSSION

Three types of targeted surveys for rare plants and rare exemplary natural communities were conducted in the Project area:

- Revisit surveys of previously identified occurrences were conducted within Segment 4 and most of Segment 3;
- Targeted surveys for the small-whorled pogonia were conducted in areas where models had predicted suitable habitat characteristics in Segment 3; and,
- Standard meander surveys were conducted for identification of any rare plants or rare communities for the remainder of Segment 3, and all of Segments 2 and 1.

4.1 REVISIT SURVEYS OF PREVIOUSLY KNOWN OCCURRENCES

Surveys were conducted in 2007 along parts of the Project area for Segments 4 and 3. These surveys identified five rare plant populations, and two rare communities. Only three of the five rare plant populations were identifiable during the July 2018 surveys. Two species were not encountered in previously identified areas: wild leek and autumn fimbry. The wild leek population previously on the south side of Carrabassett River was not relocated in the current effort. A grid search was executed in late July, by which time flowering stems are normally visible, by the surveyor (Gilman) who previously identified this small population (10 stems), within the polygon previously mapped as containing the species. The population of fall fimbry had previously been identified near an active gravel pit, but was not relocated. Two visits were made to this location in an attempt to relocate the population, but these searches were unsuccessful. This species is an annual, and given the nature of the site and the small size of the original population, it may simply have not persisted.

The three plant population that were re-located were red-stemmed gentian, long-leaved bluets, and dryland sedge. Although the flowers are not in blossom in July, the gentian plants were distinct in their vegetation form along the wetland edge near their previously documented location. The plants were generally of good vigor and scattered throughout the wetland. Surveyors were able to document additional occurrences of plants within this population from what was previously known. This included plants growing up near the edge of the existing powerline ROW clearing, in more upland-like habitats.

The population of long-leaved bluet was observed by the lead surveyor (Gilman), who had previously conducted the rare plant surveys, to have much reduced in vigor and number of individuals from what was previously documented. Plants were generally scattered across the gravel area where they were previously found, however clumps were more dispersed than previously documented, with only one patch at the strong vigor remembered from 2008. It appears that, as growth of lichens, mosses, and vascular plants has continued over time, the habitat for the disturbance-adapted bluets has become too stabilized for recruitment. A seed-bank is likely present throughout so that, if disturbances should occur, the population may increase again. Plants were in flower and leaf during the July field survey.

The dry-land sedge population was of similar vigor and extent as previously documented, however the lead surveyor (Gilman), who had previously conducted the rare plant surveys, noted the ramets were more suppressed than previously documented and indicated competition from other herbs and shrubs. A few areas of the population had plants that were not suppressed. Plants were in fruit and flower.

The previously identified rare natural communities were both different from what was observed a decade ago. The area previously identified as an Enriched Northern Hardwood Forest along the Androscoggin River, was revised to a Hardwood River Terrace Forest, upon more detailed investigation. No basswood trees were found during this survey, although butternut was present. There was a notable lack of silver maple or cottonwood trees.

The Hardwood River Terrace Forest along the Carrabassett River was much more invaded by invasive honeysuckle (approximately 40 to 50 percent cover), which is substantially more than was observed in 2007.

4.2 TARGETED SMALL-WHORLED POGONIA SURVEYS

Landscape analysis models were used to predict potential occurrences of the federally listed threatened small-whorled pogonia (Appendix E). Surveyors performed targeted detailed searches within these search areas. The general forest communities consisted of sparse overstory and relatively closed forest canopy. It should be noted that the model sometimes included open ROW habitat, covered in juniper, and other open habitats. These habitats are unsuitable for small-whorled pogonia, therefore, surveys focused on the forested habitats, though a walk-through was also conducted through the open ROW, where the model indicated potential occurrence.

One occurrence of small-whorled pogonia was documented, as described above, within an Oak-Pine Forest. This occurrence consisted of one individual growing on the north side of a stream embankment in a dense canopy forest with very little understory or groundcover. An intensive search to the end of the Project area limits and north and south along the existing powerline ROW was conducted and no other individuals were identified in the area. The plant was located just west of the proposed clearing limits (10 to 12 feet, according to GPS).

4.3 NEW OCCURRENCES

Few populations of rare plants were recorded along the majority of the proposed route. Much of the proposed area is either in typical matrix habitat or previously disturbed due to logging, plantations, or transmission line activities. Evidence of past settlement was also present in many areas, such as stone walls, orchard vegetation, and old roads. The northern habitats were dominated by forests in regeneration after clear-cut logging. More intensive surveys were conducted in habitats with higher potential to contain rare species, while recently disturbed cutover areas and areas in dense regeneration received a less-intense survey effort. New documented populations were generally small, with the exception of one boreal bedstraw population and the newly identified red-stemmed gentian population.

5.0 REFERENCES

CMP (Central Main Power). 2018. New England Clean Energy Connect (NECEC) Project. Rare Plant and Exemplary Natural Community Landscape Analysis and Field Survey Protocol.

MNAP (Maine Natural Areas Program). 2018a. Maine Natural Areas Program – State and Global Rarity Ranks. Maine Department of Agriculture, Conservation and Forestry. Accessed (August 2018) from the website: https://www.maine.gov/dacf/mnap/features/rank.htm

MNAP. 2018b. Maine Natural Areas Program – Maine Rare Plant List and Rare Plant Fact Sheets. Maine Department of Agriculture, Conservation and Forestry. Species fact sheets (accessed August 2018) from the website: https://www.maine.gov/dacf/mnap/features/rare_plants/plantlist.htm

MNAP. 2018c. Maine Natural Areas Program – Natural Community Fact Sheets. Maine Department of Agriculture, Conservation and Forestry. Community fact sheets (accessed August 2018) from the website: https://www.maine.gov/dacf/mnap/features/commsheets.htm

APPENDIX A

Overview Map of Project Area and Plant Locations

70°W

JackPineWood004DMC
JackPineWood006DMC
GALKAM002DMC
GALKAM003DMC
GALKAM001DMC
EA03AR
GERU04AR
HOLO01AR
GERU01AR
TRCL01AR
GERU02AR
Hardwood River Terrace Forest
LIDU01AG
EA01AR
ISME01AR
CASI02AR
CASI01AR

Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14

MEGANTIC MOUNTAIN
BOUNDARY MOUNTAINS
BLUE MOUNTAINS
WHITE MOUNTAINS
SANDWICH RANGE
UNITED STATES
CANADA
MAINE
NEW HAMPSHIRE
VERMONT

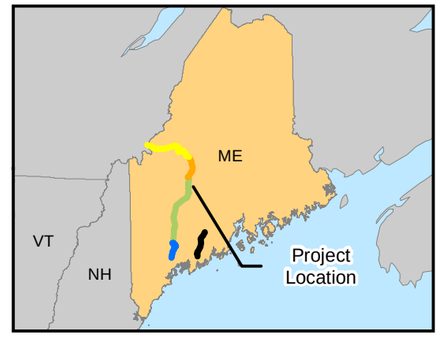
70°W

Legend

- Natural Community
- Rare Plant

NECEC Centerline

- Segment 1, New ROW
- Segment 2, The Forks to Wyman Hydro
- Segment 3, Wyman Hydro to Larrabee Road
- Segment 4, Rebuilds
- Segment 5, Maine Yankee to Coopers



N

0 4 8 16 24 Miles

Rare Plant Survey Overview
July 2018

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 7/2018

Source: Esri, et. al., 2014; CMP 2018

Coordinate System: North American Datum, 1983 Universal Transverse Mercator, Zone 19 North

APPENDIX B

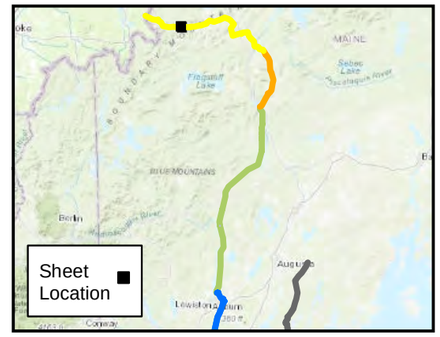
Maps of Documented Rare Plant Populations and Rare Natural Communities

Legend

- Rare Plant
- Survey Areas
- NECEC Project
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 1, New ROW



N

0 30 60 120 Feet

Rare Plant Survey Results - July 2018

Sheet 1 -
Galium kamtschaticum

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

JackPineWood005DMC

3006-157

3006-156

Segment 1, New ROW

3006-155

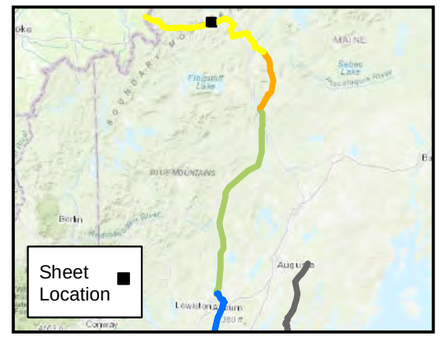
JackPineWood004DMC

Legend

- Natural Community
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 1, New ROW



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 2 -
Jack Pine Forest

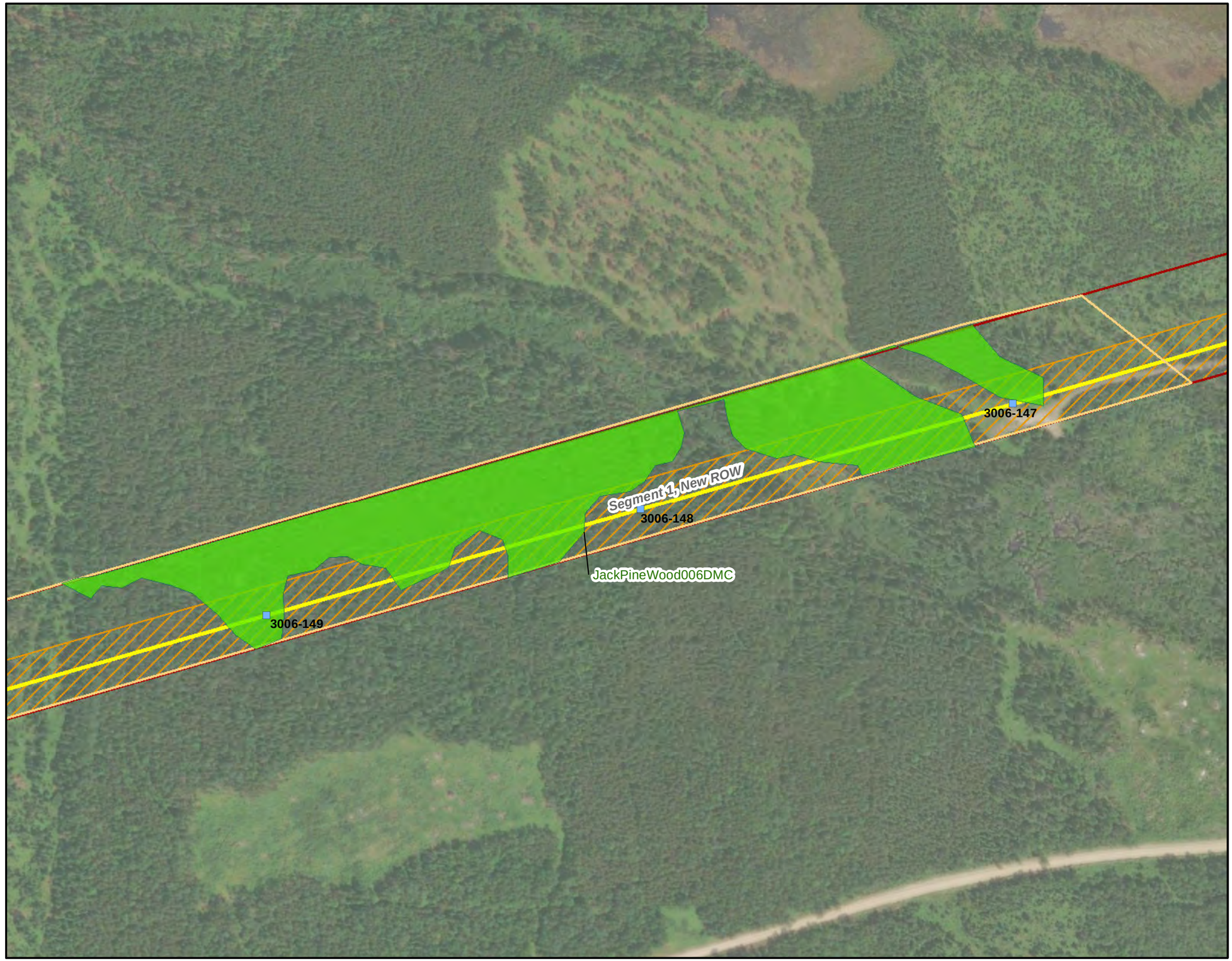
Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

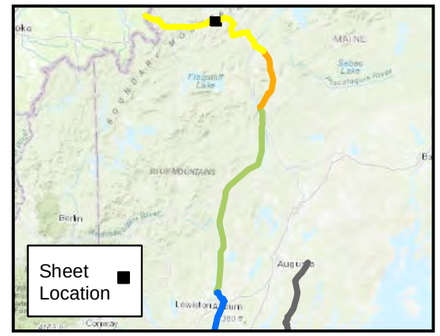


Legend

- Natural Community
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 1, New ROW



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 3 -
Jack Pine Forest

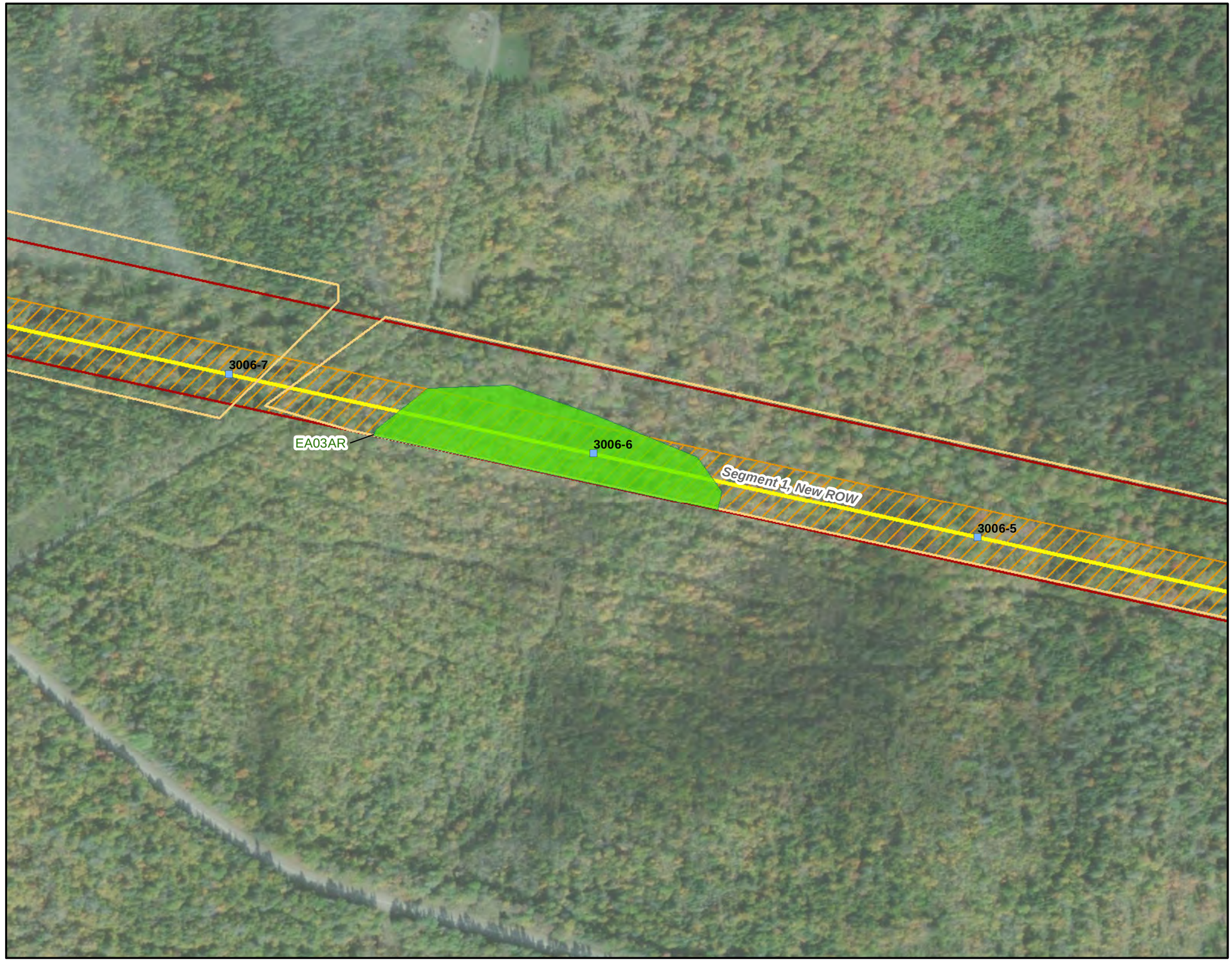
Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

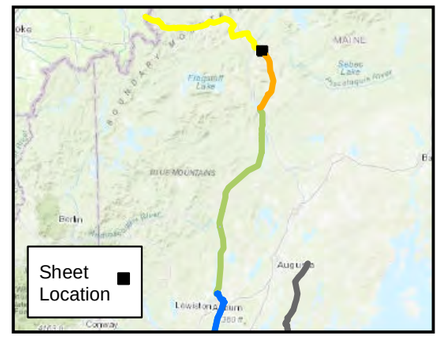


Legend

- Natural Community
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 1, New ROW



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 4 -
Enriched Northern Hardwood Forest

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

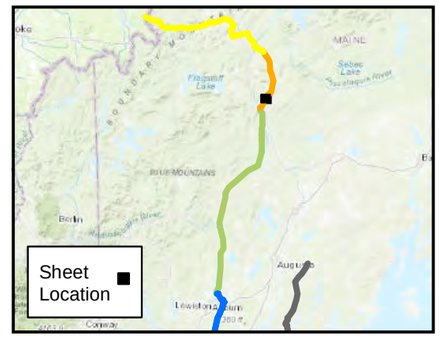
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Rare Plant
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 2, The Forks to Wyman Hydro



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 5 -
Dryopteris goldiana

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

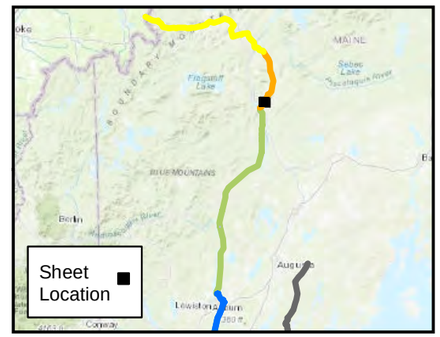
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Rare Plant
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 2, The Forks to Wyman Hydro



N

0 40 80 160 Feet

Rare Plant Survey Results - July 2018

Sheet 6 -
Trichophorum clintonii

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

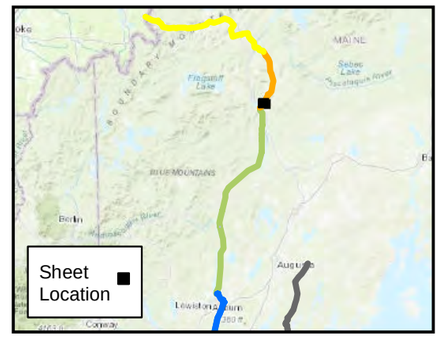
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Rare Plant
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 2, The Forks to Wyman Hydro



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 7 -
Gentiana rubricaulis

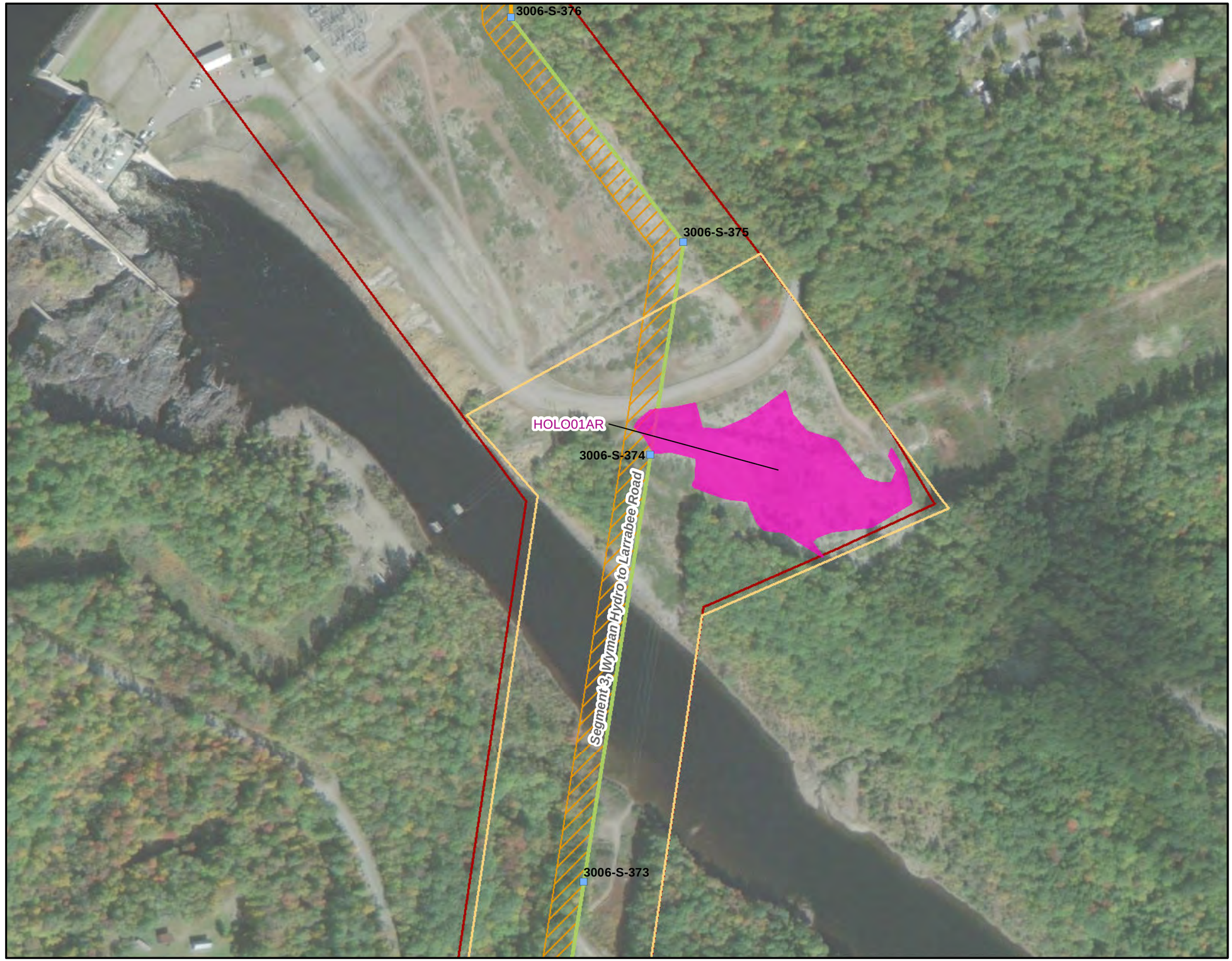
Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

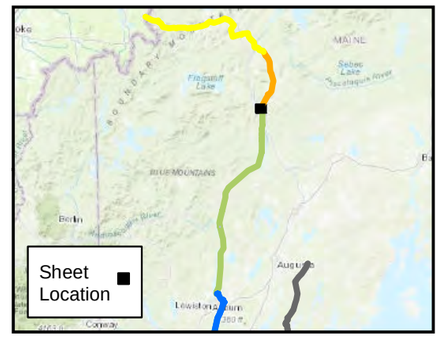


Legend

- Rare Plant
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 2, The Forks to Wyman Hydro
- Segment 3, Wyman Hydro to Larrabee Road



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 8 -
Houstonia longifolia

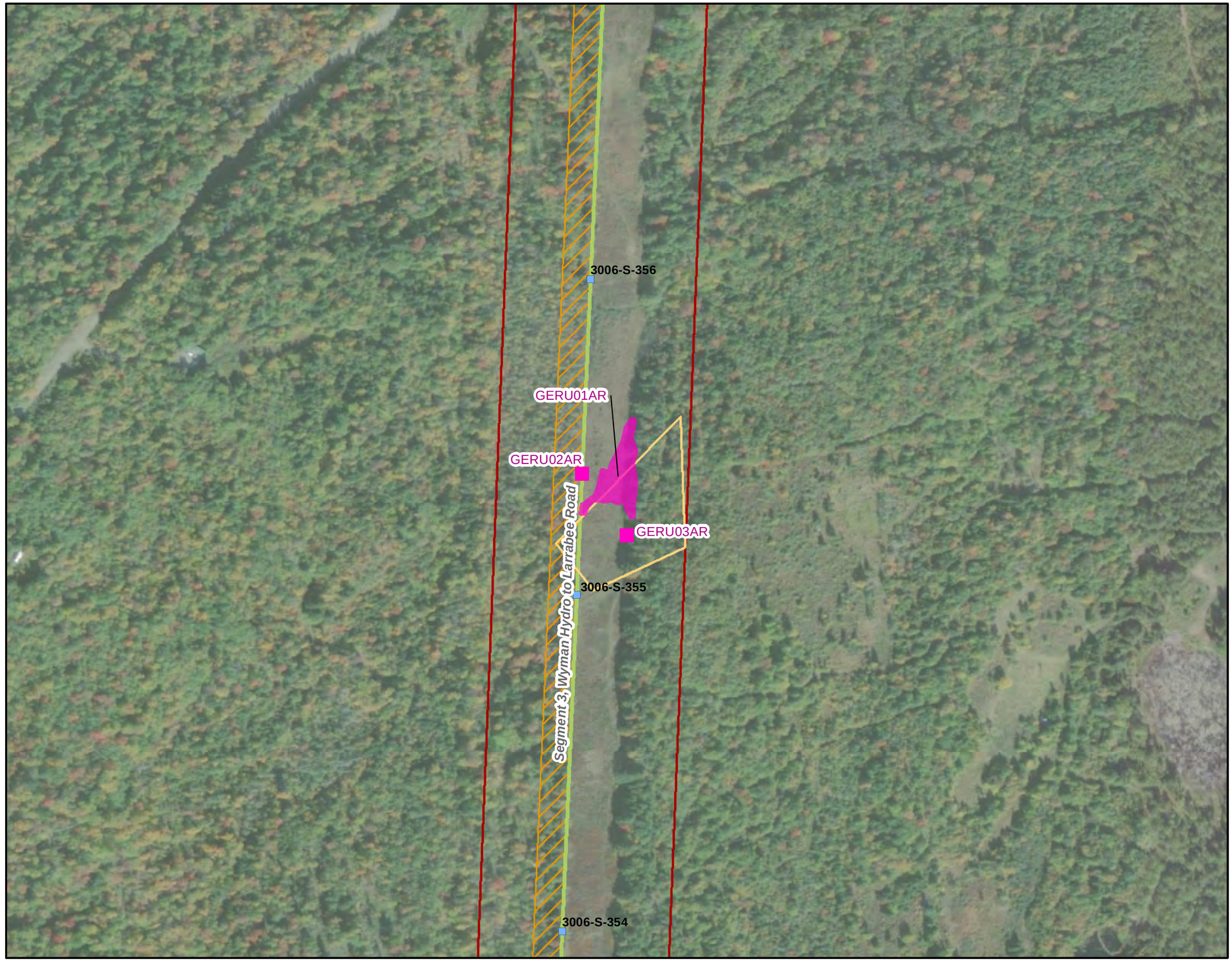
Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

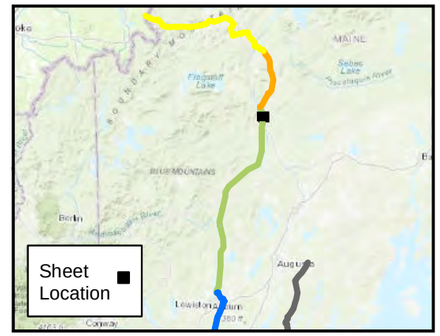


Legend

- Rare Plant
- Survey Areas
- NECEC Project
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 3, Wyman Hydro to Larrabee Road



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 9 -
Gentiana rubricaulis

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

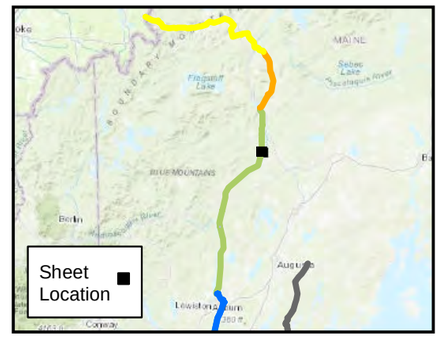
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Natural Community
- Survey Areas
- NECEC Project
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 3, Wyman Hydro to Larrabee Road



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 10 -
Hardwood River Terrace Forest

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

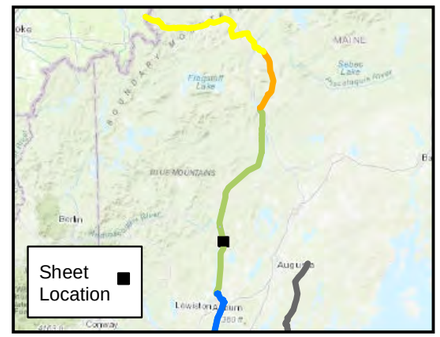
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Natural Community
- Survey Areas
- NECEC Project
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 3, Wyman Hydro to Larrabee Road



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 11 -
Enriched Northern Hardwood Forest

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

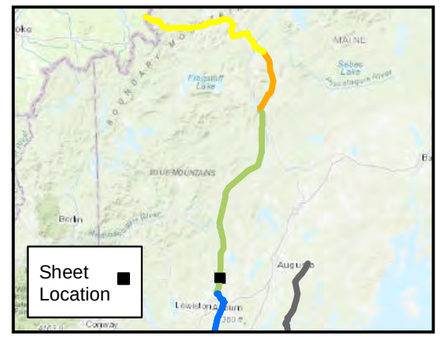
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Rare Plant
- Survey Areas
- *Isotria medeoloides* Search Area
- NECEC Project
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 3, Wyman Hydro to Larrabee Road



N

0 125 250 500 Feet

Rare Plant Survey Results - July 2018

Sheet 12 -
Isotria medeoloides

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

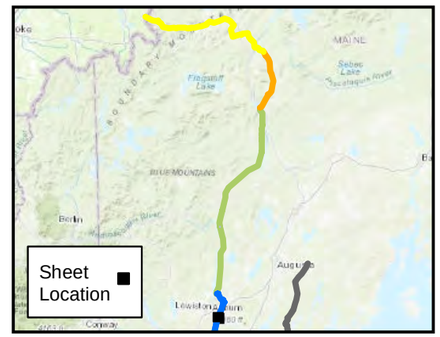
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Rare Plant
- Survey Areas
- NECEC Project
- NECEC Proposed Structures

NECEC Centerline

- Segment 4, Rebuilds



N

0 40 80 160 Feet

Rare Plant Survey Results - July 2018

Sheet 13 -
Carex siccata

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

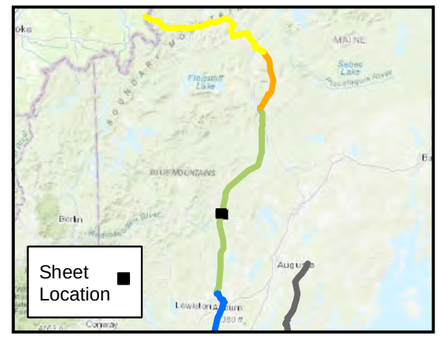
Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

Legend

- Rare Plant
- Survey Areas
- NECEC Project Area
- NECEC Clearing Limits
- NECEC Proposed Structures

NECEC Centerline

- Segment 3, Wyman Hydro to Larrabee Road



N

0 40 80 160 Feet

Rare Plant Survey Results - July 2018

Sheet 14 -
Lindernia dubia var. anagallidea

Prepared For: CENTRAL MAINE POWER

Prepared By: TETRA TECH

Date: 07/2018

Source: Esri, et. al., 2014, CMP 2018

Coordinate System: North American Datum, 1983
Universal Transverse Mercator, Zone 19 North

APPENDIX C

Photographic Log

Photo 1. Isotria medeoloides growing along a steep embankment in leaf litter.

Photo 2. Photo showing habitat Isotria mediolodes was growing in; just up and to the right of the tree on the left side of the photo, with the yellow flagging wrapped around it.

Photo 3. Isotria medeoloides growing on steep hillslope leading to small forested stream.

Photo 4. Photo showing hillslope plant was growing on, the stream below, and the forest community it is growing within.

Photo 1. Gentiana rubricalis – S. of Jackson Pond Road. View of a plant from the top, showing shiny thicker leaves, clasping around the stem, and slightly whorled appearance

Photo 2. Gentiana rubricalis – S. of Jackson Pond Road. Closer view of a multi-stem cluster near cattails. The shiny leaf appearance and distinct leaf shape are apparent in this photo

Photo 3. Gentiana rubricalis – S. of Jackson Pond Road. Plants growing with associated species. This was a common association for the population

Photo 4. Gentiana rubricalis – S. of Jackson Pond Road. Plants growing with typical associated species. Photo also shows stem and leaf morphology

Photo 1. Gentiana rubricalis – S. of Beaudoin Road. Plants growing along edge of wetland in open ROW.

Photo 2. Gentiana rubricalis – S. of Beaudoin Road. Plants growing within forested cedar swamp up to 30 feet into the forest from the open ROW edge

Photo 3. Gentiana rubricalis – S. of Beaudoin Road. Plants growing in the forest edge, on hummocks within a forested cedar swamp.

Photo 4. Gentiana rubricalis – S. of Beaudoin Road. Typical ROW growing habitat along the edge of a cattail wetland

Photo 1. Carex siccata growing in patch near river.

Photo 2. View of Carex siccata population along river terrace.

Photo 3. Close-up of fruiting bodies of Carex siccata.

Photo 4. Close-up view of Carex siccata growing in amongst poison ivy and raspberry.

Photo 1. Overview of multiple stems of *Galium kamtschaticum* in old logging trail/actively used moose path GALKAM001DMC.

Photo 2. Stem of flowering *Galium kamtschaticum* GALKAM001DMC.

Photo 3. *Galium kamtschaticum* GALKAM001DMC.

Photo 4. Habitat overview of *Galium kamtschaticum* for GALKAM001DMC.

Photo 1. Overview of multiple stems of *Galium kamtschaticum* in old logging trail wetland GALKAM002DMC.

Photo 2. Stem of *Galium kamtschaticum* GALKAM002DMC and surrounding herbaceous community.

Photo 3. *Galium kamtschaticum* GALKAM002DMC.

Photo 1. Overview of multiple stems of *Galium kamtschaticum* in old logging trail drainage PEM wetland GALKAM003DMC.

Photo 2. *Galium kamtschaticum* GALKAM003DMC.

Photo 3. *Galium kamtschaticum* GALKAM003DMC displaying fruiting bodies.

Photo 4. *Galium kamtschaticum* GALKAM003DMC leaf structure

Photo 1. Dryopteris goldiana. One plant with six separate crowns.

Photo 2. Dryopteris goldiana. Top side of plant.

Photo 3. Dryopteris goldiana. Underside of plant.

Photo 4. Dryopteris goldiana. Showing immediate surrounding habitat, including impatiens, sedges, yellow birch.

Photo 1. Trichophorum clintonii. Close-up view of plant and fruiting bodies.

Photo 2. Trichophorum clintonii. Typical growth habitat for this population; under bracken fern, in association with bunchberry dogwood.

Photo 3. Trichophorum clintonii. Clump along the edge of the bracken fern and access road

Photo 4. Trichophorum clintonii. View of population area within the bracken fern and along the edge of the access road.

Photo 1. Lindernia dubia var. anagallidea. Specimen.

Photo 1. Overview of Jack Pine Forest Natural Community looking west JACKPINEWOOD004DMC.

Photo 2. Jack Pine Forest community looking west JACKPINEWOOD004DMC.

Photo 3. Jack Pine (*Pinus banksiana*) JACKPINEWOOD004DMC showing characteristic cone morphology.

Photo 4. Jack Pine Forest community looking northwest JACKPINEWOOD004DMC.

Photo 1. Overview of Jack Pine Forest Natural Community looking northwest JACKPINEWOOD005DMC.

Photo 2. Jack Pine Forest community looking west JACKPINEWOOD005DMC.

Photo 3. Jack Pine Natural community looking west JACKPINEWOOD005DMC.

Photo 4. Jack Pine Forest community looking north along logging trail JACKPINEWOOD005DMC.

Photo 1. Overview of Jack Pine Forest Natural Community looking east JACKPINEWOOD006DMC with bracken fern understory.

Photo 2. Jack Pine Forest community looking north along logging road JACKPINEWOOD006DMC.

Photo 3. Jack Pine Natural community looking west JACKPINEWOOD006DMC.

Photo 4. Jack Pine Forest community looking northwest at forest opening JACKPINEWOOD006DMC.

	
Photo 1. Upper Floodplain Hardwood Forest – Livermore Falls. Hardwood dominated stand with a fern-dominated understory.	Photo 2. Upper Floodplain Hardwood Forest – Livermore Falls. Hardwood-dominated stand with a fern-dominated understory.

	
Photo 1. Upper Floodplain Hardwood Forest – North Anson. Community is on an upper terrace associated with Carrabassett Stream. Forest structure is young.	Photo 2. Upper Floodplain Hardwood Forest – North Anson. Young hardwood stand with fern and other typical understory herbs, but lacking in indicators of rich soil.

	
Photo 1. Enriched Northern Hardwood Forest. Rich forest spanning drier areas of wetland.	Photo 2. Enriched Northern Hardwood Forest. Slight northern aspect, abundant maidenhair fern and only occasional basswood.

APPENDIX D

Completed Field Data Forms

- Special Plant Survey Forms
- Natural Community Forms

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP Power	Survey Site:	NECE - CMP Corridor West
Quad name:	Lake Auburn East	Quad code:	44070B2
County:	Androscoggin	Town:	Greene

Plant Name: Isotria medeoloides ☒ New ☐ Update Occurrence #: 1

Date: 5 July2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone: (802) 479-7480	Email: avgilman@together.net

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 44.221891, Long.-70.168584

Directions to Occurrence: S of Allen Pond Campground Road, W side of CMP corridor, in forest ca. 90" W of treeline.
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal Explain: Moderate to robust
# of Plants 1 ☒ Individuals ☐ Ramets Population Structure 100 % Vegetative % Reproductive	☒ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☐ Mature fruit ☐ Seed dispersing ☐ Dormant	☒ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☐ Sexual ☐ Asexual ☒ Not Observed
Other Comments:			

GENERAL DESCRIPTION

Associated natural community: Moderate mixed forest

Associated plant species: Trees 30'=TSUEA 30%, Red oak 40%, Red Maple 15%, Yellow Birch 15%, no understory vegetation in immediate vicinity; no herbs within 2 feet

Substrate/soil type: mineral soil covered by 2 inches of leaf litter and duff (red oak, yellow birch, beech, pine)

Threats to Population: just outside proposed clearing limits for the proposed corridor

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min ft / m Max ft / m	☒ N ☐ NE ☐ E ☐ NW ☐ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☐ 0-10 ☐ 10-35 ☒ 35+ ☐ Vertical	☐ Open ☐ Partial ☐ Filtered ☒ Shade	☐ Crest ☐ Upper Slope ☒ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☒ Moist (mesic) ☒ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☒ No ☐ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain Slight possibility it might be I. verticillata, wihich is not currently known to be extant in Maine.

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☒ Logging-most recently ~ >60 yrs ago	☐ Fire	☐ Dumping or mining
☐ Agriculture / Pasture	☐ Impoundment	☐ ORV / Vehicle disturbance
☐ Animal effects (insect outbreaks, browsing)	☐ Exotic plants	☐ Trails / Roads
☐ Wind or ice damage	☐ Erosion	☐ Other
		☐ No Evidence of disturbance

Describe: Approximately 90ft into the forest from edge of existing ROW clearing

Condition Rank
- ☒ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
- ☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
- ☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
- ☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
- ☐ **Other** / Habitat disturbed, consistent with needs of species / **Explain**:

SIZE / QUALITY: How large is this population relative to typical populations of this species? Low
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☐ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor

Comments: One plant, vigorous but no flowers this year.

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
- ☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
- ☒ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
- ☐ **C** – Population surrounded by fragmented forest or rural landscape
- ☐ **D** – Surrounding area developed
- ☐ **Other** / Explain:

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP Power	Survey Site:	S. of Jackson Pond Road
Quad name:	Bingham	Quad code:	45069A8
County:	Somerset	Town:	Concord

Plant Name: Gentiana rubricaulis ☐ New ☒ Update Occurrence #:

Date: 6July2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone: (802) 479-7480	Email: avgilman@together.net

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 45.023784, Long. -69.883264

Directions to Occurrence: From Me, Rte. 16 in Concord, take Jackson Pond Road to CMP powerlines. On foot, follow powerlines S over knoll; access/woods road diverges E from open corridor, but follow this around E side of marshy wetland and re-enter open corridor. Plants are at marsh edge mostly along E side of open corridor but extending around powerline structure and across corridor on the side of the marsh and somewhat uphill.
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal Explain:
# of Plants 150 ☒ Individuals ☐ Ramets Population Structure 100 % Vegetative 0 % Reproductive	☒ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☐ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☒ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☐ Sexual ☐ Asexual ☒ Not Observed

Other Comments:

GENERAL DESCRIPTION

Associated natural community: Shallow marsh - sloping edge

Associated plant species: Packera shweinitziana, Geum aleppicum, Thelypteris palustris, Platanthera psycodes,

Substrate/soil type: Mapped as Berkshire f.s.l

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 450ft ft / m Max ft / m	☐ N ☐ NE ☐ E ☒ NW ☐ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☒ Open ☐ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☐ Mid-slope ☒ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☒ Saturated (wet mesic) ☐ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☒ No ☐ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☐ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Powerline corridor

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Powerline maintains non-forested condition

SIZE / QUALITY: How large is this population relative to typical populations of this species? Mid-sized
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

Comments: Population similar to when obsvered in 2007/2008; although plants are typically biennial or shrot-lived perennial, they seem to maintain numbers and vigor over time.

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☒ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: Cleared powerline corridor

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP Power	Survey Site:	S. of Beaudoin Road
Quad name:	Pleasant Ridge Pit	Quad code:	45069A8
County:	Somerset	Town:	Moscow

Plant Name: Gentiana rubricaulis ☒ New ☐ Update Occurrence #:

Date: 11July2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone: (802) 479-7480	Email: avgilman@together.net

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 45.094096, Long.-69.878232

Directions to Occurrence: Drive north out of Bingham,take stream road and the a left onto Beaudoin road, follow until you reach the existing R Population extends from just south of the road to approximately 800 feet south, along the edges of the wetland along the west side of the clearin extending into the forest for approximately 30 feet.
☒ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☐ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal Explain:
# of Plants 150 ☒ Individuals ☐ Ramets Population Structure 100 % Vegetative 0 % Reproductive	☒ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☐ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☒ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☐ Sexual ☐ Asexual ☒ Not Observed

Other Comments: Plants are distributed along the edges of the wetland, rarely extending into the supersaturated areas, however, in the forest, th are located on humocks within the cedar swamp area.

GENERAL DESCRIPTION

Associated natural community: Shallow marsh - sloping edge and cedar swam hummocks

Associated plant species: Carex flava, Typha latifolia, Salix discolor

Substrate/soil type:

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min ft / m Max ft / m	☐ N ☐ NE ☐ E ☐ NW ☒ S ☐ SE ☐ W ☐ SW ☒ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☒ Open ☐ Partial ☒ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☐ Mid-slope ☒ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☒ Saturated (wet mesic) ☐ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☒ No ☐ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☐ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Powerline corridor

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Powerline maintains non-forested condition

SIZE / QUALITY: How large is this population relative to typical populations of this species? Mid-sized
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor
Comments:

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☒ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: Cleared powerline corridor and second growth cedar swamp

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP Power	Survey Site:	Bell Farms Area/S. of Cotton Road
Quad name:	Lewiston	Quad code:	44070A2
County:	Androscoggin	Town:	Lewiston

Plant Name: Carex siccata (CASI01AR_02AR) ☐ New ☒ Update Occurrence #:

Date: 3July2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone: (802) 479-7480	Email: avgilman@together.net

GPS Datum ☐ WGS 84 ☒ NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 44.023698 Long.-70.175755

Directions to Occurrence: Located south of Cotton Road, on the low river terrace at the powerline crossing
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☐ Normal ☒ Other than normal Explain: Slightly suppressed; competing vegetation
# of Plants 3000-5000 ☐ Individuals ☒ Ramets Population Structure 99 % Vegetative 1 % Reproductive	☐ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☒ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☒ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☒ Sexual ☒ Asexual ☐ Not Observed

Other Comments: Mapped outer extent of two population groups. Large clonal patches

GENERAL DESCRIPTION

Associated natural community: Riverbank terrace/powerline corridor

Associated plant species: Rubus flagellaris, Elymus repens

Substrate/soil type: Sand; stable/fully vegetated

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min ft / m Max ft / m	☐ N ☐ NE ☐ E ☐ NW ☒ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☒ Open ☐ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☐ Mid-slope ☐ Lower Slope ☒ Bottom ☐ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☐ Moist (mesic) ☒ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☐ No ☒ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain Other sedges primarily Section Ovales with much different inflorescences.

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Powerline corridor crossing river.

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Managed powerline corridor

SIZE / QUALITY: How large is this population relative to typical populations of this species?
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor
Comments: Patches fairly large; competetion from other sun-loving species (shrubs)

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: Cleared powerline corridor in rural/agricultural surrounding

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC Segment 1	Survey Site:	FID #14 GALKAM001DMC
Quad name:	Tumbledown Mountain Quadrangle	Quad code:	USGS X24K45909
County:	Somerset	Town:	Appleton Township

Plant Name: Galium Kamtschaticum ☒ New ☐ Update Occurrence #:

Date: 7/11/18	Surveyor(s): Duane Choquette & Tom Errico	Sourcecode (MNAP assigns):
Primary Surveyor Address: 6 Ashley Drive, Scarborough, maine 04072	Phone: 518-222-1383	Email: dchoquette@trcsolutions.com

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☒ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat: 45.46625971 Long: -70.46817762

Directions to Occurrence: North slope of Tumbledown Mountain, access from Appleton Road to the west.
☒ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal Explain:
# of Plants 506 ☒ Individuals ☐ Ramets Population Structure 80 % Vegetative 20 % Reproductive	☒ In leaf ☒ In bud ☒ In flower ☒ Immature fruit ☒ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☒ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + 13 sq yds~area **actual** habitat 30 sq yds~ area **potential** habit	Evidence disease, predation, etc? Explain: Browsing damage to tips of plants ☒ Yes ☐ No Type of reproduction? Explain: Fruit present ☒ Sexual ☐ Asexual ☐ Not Observed

Other Comments:

GENERAL DESCRIPTION

Associated natural community: Northern Hardwood forest

Associated plant species: Acer saccharum, Betula alleghaniensis, Acer pensylvanicum,Glyceria striata, Impatiens capensis, Thalictrum polygamin, Oxalis montana, Galium palustre, Circaea alpina, sambucus raecemosa

Substrate/soil type: Mucky Mineral

Threats to Population: Damage caused by moose wallowing and moose trails. Logging

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 2200 ft / m Max 2310 ft / m	☒ N ☐ NE ☐ E ☐ NW ☐ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☐ 0-10 ☒ 10-35 ☐ 35+ ☐ Vertical	☐ Open ☐ Partial ☒ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☒ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☒ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☐ No ☒ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☒ Logging-most recently ~ 30 yrs ago	☐ Fire	☐ Dumping or mining
☐ Agriculture / Pasture	☐ Impoundment	☐ ORV / Vehicle disturbance
☒ Animal effects (insect outbreaks, browsing)	☐ Exotic plants	☒ Trails / Roads
☐ Wind or ice damage	☐ Erosion	☐ Other
		☐ No Evidence of disturbance

Describe: site is an old logging road, with a moose trail running down it. Plants are located on edge of moose trail.

Condition Rank
- ☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
- ☒ **B** – Some signs of human disturbance or degradation, but habitat generally intact
- ☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
- ☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
- ☐ **Other** / Habitat disturbed, consistent with needs of species / **Explain**:

SIZE / QUALITY: How large is this population relative to typical populations of this species? unknown
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

Comments: dense population flanking an old logging road. Surrounding habitat was logged 25+ years ago.

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: The surrounding land is all utilized for logging and is currently in a regenerative state from the last logging cycle.

Landscape Rank
- ☒ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
- ☒ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
- ☐ **C** – Population surrounded by fragmented forest or rural landscape
- ☐ **D** – Surrounding area developed
- ☐ **Other** / Explain:

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments: Under current conditions the population will likely continue to expand, with occasional damage from moose wallowing in the wetter portions of the habitat.

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC Segment 1	Survey Site:	FID #14 GALKAM002DMC
Quad name:	Tumbledown Mountain Quadrangle	Quad code:	USGS X24K45909
County:	Somerset	Town:	Appleton Township

Plant Name: Galium Kamtschaticum ☒ New ☐ Update Occurrence #:

Date: 7/11/18	Surveyor(s): Duane Choquette & Tom Errico	Sourcecode (MNAP assigns):
Primary Surveyor Address: 6 Ashley Drive, Scarborough, maine 04072	Phone: 518-222-1383	Email: dchoquette@trcsolutions.com

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☒ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat: 45.46604628 Long: -70.46943957

Directions to Occurrence: North slope of Tumbledown Mountain, access from Appleton Road to the west.
☒ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal Explain:
# of Plants 16 ☒ Individuals ☐ Ramets Population Structure 95 % Vegetative 5 % Reproductive	☒ In leaf ☐ In bud ☒ In flower ☐ Immature fruit ☒ Mature fruit ☐ Seed dispersing ☐ Dormant	☒ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + 0.9 sq yds~area **actual** habitat 50 sq yds~ area **potential** habit	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: Fruit present ☒ Sexual ☐ Asexual ☐ Not Observed
Other Comments:			

GENERAL DESCRIPTION

Associated natural community: Northern Hardwood forest

Associated plant species: Acer saccharum, Betula alleghaniensis, Acer pensylvanicum,Glyceria striata, Impatiens capensis, Galium palustre, Circaea alpina, sambucus raecemosa, Corylus cornuta, Nabalus altissimus, Carex utriculata, Osmunda claytonia, Trillium undulatum

Substrate/soil type: Mucky Mineral

Threats to Population: Old Logging Road, Adjacent to clearcut activities.

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 2300 ft / m Max 2320 ft / m	☐ N ☐ NE ☐ E ☒ NW ☐ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☐ Open ☐ Partial ☒ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☒ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☒ Saturated (wet mesic) ☐ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☐ No ☒ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☒ Logging-most recently ~ 30 yrs ago
☐ Agriculture / Pasture
☒ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☐ Other
☐ No Evidence of disturbance

Describe: site is a junction of two old logging roads, with a hillside seep upslope

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☒ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☐ **Other** / Habitat disturbed, consistent with needs of species / **Explain**:

SIZE / QUALITY: How large is this population relative to typical populations of this species? unknown
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

Comments: Surrounding forest was logged 25+ years ago, open logging cut located 75' to the west

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: The surrounding land is all utilized for logging and is currently in a regenerative state from the last logging cycle.

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☒ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☐ **Other** / Explain:

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments: t.

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC Segment 1	Survey Site:	FID #14 GALKAM003DMC
Quad name:	Tumbledown Mountain Quadrangle	Quad code:	USGS X24K45909
County:	Somerset	Town:	Appleton Township

Plant Name: Galium Kamtschaticum ☒ New ☐ Update Occurrence #:

Date: 7/11/18	Surveyor(s): Duane Choquette & Tom Errico	Sourcecode (MNAP assigns):
Primary Surveyor Address: 6 Ashley Drive, Scarborough, maine 04072	Phone: 518-222-1383	Email: dchoquette@trcsolutions.com

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☒ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat: 45.46598048 Long: -70.46956785

Directions to Occurrence: North slope of Tumbledown Mountain, access from Appleton Road to the west.
☒ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal Explain:
# of Plants 85 ☒ Individuals ☐ Ramets Population Structure 90 % Vegetative 10 % Reproductive	☒ In leaf ☐ In bud ☒ In flower ☐ Immature fruit ☒ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☒ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + 7 sq yds~area **actual** habitat 50 sq yds~ area **potential** habit	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: Fruit present ☒ Sexual ☐ Asexual ☐ Not Observed

Other Comments:

GENERAL DESCRIPTION

Associated natural community: Northern Hardwood forest

Associated plant species: Acer saccharum, Betula alleghaniensis, Acer pensylvanicum,Glyceria striata, Impatiens capensis, Carex utriculata, Osmunda claytonia, Carex gynandra

Substrate/soil type: Mucky Mineral

Threats to Population: Old Logging Road, Adjacent to clearcut activities.

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 2300 ft / m Max 2325 ft / m	☐ N ☐ NE ☐ E ☒ NW ☐ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☐ Open ☒ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☒ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☒ Saturated (wet mesic) ☐ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☐ No ☒ Yes If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☒ Logging-most recently ~ 30 yrs ago
☐ Agriculture / Pasture
☒ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☐ Other
☐ No Evidence of disturbance

Describe: The site is on an old logging road.

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☒ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☐ **Other** / Habitat disturbed, consistent with needs of species / **Explain**:

SIZE / QUALITY: How large is this population relative to typical populations of this species? unknown
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor
Comments: Surrounding forest was logged 25+ years ago, open logging cut located 75' to the west

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: The surrounding land is all utilized for logging and is currently in a regenerative state from the last logging cycle.

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☒ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☐ **Other** / Explain:

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments: t.

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP Power	Survey Site:	Off of Stream Road/S. of Deadwater Radar Station
Quad name:	Mahoney Hill	Quad code:	45069A7
County:	Somerset	Town:	Moscow

Plant Name: Dryopteris goldieana ☒ New ☐ Update Occurrence #:

Date: 12July2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address:	Phone:	Email:

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 45.117098, Long. -69.861951

Directions to Occurrence: Take Stream Road, off of Highway 16 (north of Bingham) to where it parallels the existing powerline. Just before the powerline bends to the east, there is a side road that takes off towards Austin Stream. Stop here and head northwest. The population is locat swampy draw/old road, approximately 70 feet into the woods from the west side of the ROW clearing
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☒ Normal ☐ Other than normal
# of Plants 2 ☒ Individuals ☐ Ramets Population Structure 30 % Vegetative 70 % Reproductive	☐ In leaf ☐ In bud ☐ In flower ☒ Immature fruit ☐ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☒ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Explain: Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: spores and multiple plants from one crown ☒ Sexual ☒ Asexual ☐ Not Observed

Other Comments: Took a single point between the two individuals; wich were approximately 3 ft apart

GENERAL DESCRIPTION

Associated natural community: Moist clearing in mucky loam in drainage/old road bed embedded in beech-maple-birch forest

Associated plant species: Impatiens capensis (presumed, no flowers seen); Glyceria striata, Alnus serrulata,

Substrate/soil type: Mucky loam, spongy with high organics

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 1120' ft / m Max ft / m	☐ N ☐ NE ☐ E ☐ NW ☐ S ☐ SE ☐ W ☐ SW ☒ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☐ Open ☐ Partial ☒ Filtered ☐ Shade	☐ Crest ☒ Upper Slope ☐ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☒ Saturated (wet mesic) ☒ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☐ No ☒ Yes Dryopteris carthusiana If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Powerline corridor nearby

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☒ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Small population (likely one clone), limited availanle habitat in small swale; managed powerline corridor nearby and old logging activity crisscrosses the area

SIZE / QUALITY: How large is this population relative to typical populations of this species? Small
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor

Comments: Consists of one clone, but that appears to be fairly old with several "crowns" off one rhizome.

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments: C

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☒ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: in woods off of cleared powerline corridor in rural managed forest area

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP Power	Survey Site:	Wyman Dam Access Road
Quad name:	Bingham	Quad code:	45069A8
County:	Somerset	Town:	Moscow

Plant Name: Houstonia longifolia ☐ New ☒ Update Occurrence #:

Date: 6 July2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone: (802) 479-7480	Email: avgilman@together.net

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 45.067711, Long.-69.898568

Directions to Occurrence: Located to the south side of the Wyman Dam access road, where the current powerline ROW crosses the road as it co south from the dam

☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☒ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☐ Normal ☒ Other than normal Explain: Normal in recently (<10 years) disturbed microhabitats, vigor depressed in more stabilized (lichenized) microhabitats
# of Plants 500 ☒ Individuals ☐ Ramets Population Structure 100 % Vegetative 0 % Reproductive	☒ In leaf ☒ In bud ☒ In flower ☐ Immature fruit ☐ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☒ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☒ Sexual ☐ Asexual ☐ Not Observed

Other Comments: mapped outer extent of disperse population. Individuals were very scattered; sometimes clumped and sometimes disperse. Number of individuals estimated between 400-500

GENERAL DESCRIPTION

Associated natural community: Shallow marsh - slopine edge

Associated plant species: Danthonia spicata, Centaurea stoebe, Juniperus communis, Drymocallis arguta, Lechea intermedia

Substrate/soil type: Gravel alluvium/ topsoil removed/scraped

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min ft / m Max ft / m	☐ N ☐ NE ☐ E ☒ NW ☐ S ☐ SE ☐ W ☐ SW ☒ Flat or NA	☐ Flat ☒ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☒ Open ☐ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☐ Mid-slope ☐ Lower Slope ☐ Bottom ☒ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☐ Moist (mesic) ☒ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☒ No ☐ Yes Collection # Repository	☐ No ☒ Yes Houstonia caerulea (a few) If yes, are there hybridization issues? ☒ No; ☐ Yes; Explain Are there identification issues? ☒ No; ☐ Yes; Explain Plant habit of two species much different

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Powerline corridor near dam operations on river terrace

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Plants most vigorous in areas disturbed for pole intallation a few years ago.

SIZE / QUALITY: How large is this population relative to typical populations of this species? Large
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☒ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

Comments: When first observed this was a very large, very vigoorus population but is now much smaller in terms of numbers and vigor of plants, due primarily to stabilization of the habitat, especially by lichens (which acidify habitat conditions and suppress plant growth, seeedlign survival, etc,).

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: Not a natural habitat; maintained by powerline maintenance

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments: Rank diminishing but still a large population, and likely a large seed-bank present as well.

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP	Survey Site:	N. of Bassett Lane/Chase Stream
Quad name:	Mahoney Hill	Quad code:	45069A7
County:	Somerset	Town:	Moscow

Plant Name: Trichophorum clintonii ☒ New ☐ Update Occurrence #:

Date: 12 July 2018	Surveyor(s): Art Gilman and Anna Ritchie	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone:	Email: avgilman@together.net

GPS Datum ☐ WGS 84 ☒ NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 45.101345, Long.-69.872975

Directions to Occurrence: North of Bassett Lane on the west side of the ROW crossing, about 100 ft up the access road. The population is most the east side of the access road, under the bracken fern, with some clumps in the road and along the west side
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☐ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☒ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☐ Normal ☒ Other than normal Explain: Slightly suppressed; competing vegetation
# of Plants 15+/- ☐ Individuals ☒ Ramets Population Structure 40 % Vegetative 60 % Reproductive	☒ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☒ Mature fruit ☒ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☒ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☒ Sexual ☐ Asexual ☐ Not Observed

Other Comments: Polygon represents approximate distribution of observed clumps; unconventional habitat for species, which is typically found adjacent to rivers/streams.

GENERAL DESCRIPTION

Associated natural community: Dry sandy soil in and adjacent to access road/powerline corridor

Associated plant species: Pteridium aquilinum, Juncus tenuis

Substrate/soil type: sandy loam with gravel

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 650' ft / m Max ft / m	☐ N ☐ NE ☐ E ☐ NW ☒ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☐ 0-10 ☒ 10-35 ☐ 35+ ☐ Vertical	☒ Open ☐ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☒ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☐ Moist (mesic) ☒ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☐ No ☒ Yes Collection # Gilman18024 Repository avg	☒ No ☐ Yes If yes, are there hybridization issues? ☐ No; ☐ Yes; Explain Are there identification issues? ☐ No; ☒ Yes; Explain Somewhat depauperate; fruit already dispersed, and unusual habitat

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Powerline corridor

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Managed powerline corridor

SIZE / QUALITY: How large is this population relative to typical populations of this species?
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☐ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor
Comments: Robust clumps, population fairly large, but atypical habitat

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: Cleared powerline corridor in rural/managed forest setting

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments: Atypical, appears stable but may decline over time.

MNAP reviewed / verified rank ☒ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site:	NECEC CMP	Survey Site:	S of Plaisted Road
Quad name:	Wilton	Quad code:	4407000
County:	Franklin	Town:	Jay

Plant Name: Lindernia dubia var. anagallidea ☒ New ☐ Update Occurrence #:

Date: 28 July 2018	Surveyor(s): Art Gilman	Sourcecode (MNAP assigns):
Primary Surveyor Address: Gilman and Briggs Environmental 1 Conti Cir # 5, Barre, VT 05641	Phone: 802-479-7480	Email: avgilman@together.net

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☒ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates Lat. 44.54054, Long. -70.163594

Directions to Occurrence: In abandoned gravel pit area S of Plaisted Road, under existing powerlines: either enter using access to existing gravel pit, or follow snowmobile trail downslope from Plaisted Road; eventually turn left on old road into pit area; plants in a small mud-puddle area in disturd/abandoned pit floor
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☒ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☐ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☒ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☐ Normal ☒ Other than normal Explain: Starved/small
# of Plants 15-20 ☐ Individuals ☒ Ramets Population Structure 40 % Vegetative 60 % Reproductive	☒ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☒ Mature fruit ☒ Seed dispersing ☐ Dormant	☐ 1 square yard ☒ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☒ No Type of reproduction? Explain: ☒ Sexual ☐ Asexual ☐ Not Observed

Other Comments: Very limited availabel habitat (mud-puddle damp, vs. dry sand surrounding)

GENERAL DESCRIPTION

Associated natural community: NA/ general forest/powerline/gravel pit

Associated plant species: Juncus tenuis, Agalilnis tenuifolia

Substrate/soil type: sandy, slight mud surface

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min 590' ft / m Max ft / m	☐ N ☐ NE ☐ E ☐ NW ☐ S ☐ SE ☐ W ☐ SW ☒ Flat or NA	☒ Flat ☐ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☒ Open ☐ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☐ Mid-slope ☐ Lower Slope ☒ Bottom ☐ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☒ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken?	Specimen collected?	Do other members of this genus occur at this site?
☐ No ☒ Yes	☐ No ☒ Yes Collection # Gilman18031 Repository avg	☒ No ☐ Yes If yes, are there hybridization issues? ☐ No; ☐ Yes; Explain Are there identification issues? ☐ No; ☒ Yes; Explain Depauperate

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☒ Dumping or mining
☐ ORV / Vehicle disturbance
☒ Trails / Roads
☒ Other
☐ No Evidence of disturbance

Describe: Gravel quarry

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☒ **Other** / Habitat disturbed, consistent with needs of species / **Explain**: Managed powerline corridor/gravel pit

SIZE / QUALITY: How large is this population relative to typical populations of this species? ? Small
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☐ Yes ☒ No

Size / Quality Rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☒ **D** – Poor

Comments: Small population, depauperate plants; not sustainable

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☒ **Other** / Explain: Gravel pit/quarry

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☒ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

NATURAL COMMUNITY SURVEY

Project New England Clean Energy Connect (NECEC)

I. IDENTIFIERS / LOCATION

Site Name: NECEC FID #11	**Obs. Pt. #: JACKPINEWOOD004DMC**	**Quadcode:**
Field-assigned Community Type: Jack Pine Forest Identification or classification difficulties? Describe: None		USGS 7.5' Quad Name: Spencer Lake Quadrangle Town: Bradstreet Township T4 R7
MNAP REVIEWED/EdITED TYPE:	Occurrence #:	County: Somerset
LANDOWNER INFORMATION: for each landowner Map | Lot | Name (& address if new landowner)		Date: 7/18/18 Surveyors: Duane Choquette & Tom Errico SourceCode: F_____ Biophysical Region: Western Mountains

GPS Coordinates (● NAD 83, UTM Zone 19N; ☐ Other-please specify) centerpoint Lat: 45.49568, Long: -70.25400

Directions to occurrence: From the Town of Jackman, Maine: Take State Route 201 south to Spencer Road. Spencer Road west to Moore Pond, Proceed north to Egg Pond. Jack Pine woodland is northwest of Egg pond, between egg pond and Bitter Brook.

● Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

FEATURE MAP. Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation. Locational uncertainty refers to any uncertainty there is as to where the actual observation occurred. Confidence extent indicates how confident you are that the observed area represents the full extent of the feature.

Locational Uncertainty:None

☐ Areal delimited

● Mapped to within 12.5 m of actual location

☐ Greater uncertainty (please indicate)

_____50_____ m / ft / km / miles

Confidence Extent:

☐ **Y** - Confident full extent of feature **IS** known

● **N** - Confident full extent is **NOT** known

☐ **?** - **Uncertain** whether full extent is known

GENERAL DESCRIPTION OF COMMUNITY(See instructions for guidelines):

Predominately Jack pine (70%), with mixed white pine, red pine and red spruce in the canopy. The understory is dry and open, with lowbush blueberries and laurels found sporadically in patches. The Jack Pine woodland abuts regenerating clear-cuts to both the east and west, which are dominated by young red spruce, though scattered young jack pines can be found throughout.

SAMPLE TYPE:	Additional sampling recommended?
____ Brief descriptive – **NOT SUFFICIENT FOR DOCUMENTING NEW EOs**	X Yes ☐ No
__X__ Generalized cover estimates & dbhs (p2)	Photos: X Yes ☐ No
____ Nested plot samples (N = _____) (attach)	

II. VEGETATION BY STRATA

Community name & EO#:

TREE LAYER (canopy plus emergents, everything ≥ 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% [60%] **70%** 80% 90+%

Total Basal Area: ft²/acre

Conifer %:100

Canopy height _50ft_____ m or ft

Supercanopy spp?

Species name/code	Cover class*	Dbh range X☐in ☐ cm	Core ages	Species name/code	Cover class*	Dbh range ☐in ☐cm	Core ages	☐ check here if plot data are attached instead
Pinus banksiana	87							
Pinus strobus	9	6-8						
Picea rubens	9	6-8						
Pinus resinosa	1	4-8						
		6-8						

SAPLING / TALL SHRUB LAYER (> 3 m tall and < 10 cm dbh)

TOTAL COVER OF STRATUM: <5% [10%] 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Picea rubens	3			
Pinus banksiana	9			

SHRUB LAYER (woody plants ~1 - 3 m tall)

TOTAL COVER OF STRATUM: <5% 10% [20%] 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Kalmia angustifolia	19			
Vaccinium angustifolium	19			

HERB / DWARF SHRUB LAYER (all herbaceous vascular plants plus any woody plants < 1 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% [40%] 50% 60% 70% 80% 90+%

DOMINANCE : tree regen___10_____%; shrub__10_____%; graminoid____0____%; forb___20____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Pteridium aquilinum	37			
Gaultheria procumbens	19			
Cornus canadensis	19			

BRYOID LAYER (all ground-layer non-vascular plants; do not include epiphytes)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% [70%] 80% 90+%

DOMINANCE: bryophytes___100_____% lichens _____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Pleurozium schreberi	87			
Huperzia lucidula	19			

*cover classes (**midpoint**): < 2%= **1**, 2-5%= **3**, 6-12%= **9**, 13-24%= **19**, 25-49%= **37**, 50-74%= **63**, 75-100%= **87**

ADDITIONAL SPECIES within area where vegetation cover by strata were taken

Stratum	Species code	Cover class	Stratum	Species code	Cover class

OTHER PLANT SPP seen in community (spp codes), for complete plant species list

III. ENVIRONMENTAL SETTING

Community name & EO#:

SOILS (rooting zone):

Sample #_004___

Depth to which soil examined___25cm_____

Organic layer depth_____12_____cm or ☐ >1 m

Mineral layer below organic? ____yes___depth___12cm_____

Mottling in top 30 cm?___No____depth_____

Depth to water table:__unknown_____

Depth to obstruction:__25cm_____ nature of obstruction:____bedrock_____

Stoniness: ☐ very little (<1%)/ ● moderate (2-25%)/ ☐ very (>25%)

pH:__unknown_____ measured in ☐ soil or ☐ interstitial water

vonPost decomposition (peat substrates only) _____ at _____ deep

ELEVATION:1200ft

☐ m or ● ft?

ASPECT (TRUE): South

SLOPE : Include units! (45º = 100%)

10% = 25%

☐ measured ● estimated

HYDROLOGIC REGIME:

☐ upland

☐ nontidal wetland:
- ☐ perm flooded
- ☐ semiper flooded
- ☐ seasonally fld.
- ☐ saturated

☐ tidal – irreg. fld.
☐ tidal – reg. fld.
- ☐ saltwater
- ☐ brackish
- ☐ freshwater

☐ unknown

HABITAT PATCHINESS (describe zones or patches if present):

Dense central stand, outer edges border logging clearcuts with regenerating spuce being dominant.

MICROTOPOGRAPHY:

Jack Pine Forest is on a small hill overlooking regenerating clear cuts on West, North and East sides.

AVERAGE TEXTURE:

☐ gravel
☐ sand
● loamy sand / sandy loam
☐ loam
☐ silt loam
☐ clay loams
☐ sandy clay / clay
☐ peat
☐ muck

DRAINAGE & MOISTURE REGIME (see MAPPSS key):

☐ very poorly drained
☐ poorly drained
☐ somewhat poorly drained
☐ moderately well drained
☐ well drained
☐ somewhat excessively drained
☐ excessively drained

BEDROCK TYPE:

☐ Igneous
- ● granite
- ☐ dioritic
- ☐ gabbroic

☐ Metamorphic
- ☐ slate/phyllite
- ☐ schist/gneiss

☐ Sedimentary
- ☐ limestone
- ☐ other

details?

TOPOGRAPHIC POSITION

☐ D drainage channel
☐ P low plain, level
☐ N narrow valley
☐ T toe of slope
☐ L lower slope
☐ M middle slope
● T hillside terrace
☐ U upper slope
☐ E cliff/ledge
☐ S ridge, summit, crest

SURFICIAL DEPOSIT:

● bedrock
☐ talus slope
☐ glacial till
☐ moraine
☐ esker/outwash
☐ glacial delta
☐ lacustrine/fluvial
☐ marine
☐ aeolian
☐ other:

THREATS TO COMMUNITY? Logging

MANAGEMENT / PROTECTION NEEDS?

OTHER COMMENTS: animal use, species distribution notes, etc.
Jack pine forest northwest of Egg pond. The stand is bordered by three large logging cuts, to the north east, and west. The Jack pine Forest extends south outside of the study corridor. An examination of aerial photography and field reconnaissance shows the jack pine forest ending in a spruce bog community.

IV. SUMMARY AND RANKING

Community name & EO#:

Applicable National Type:	NVC CODE: CEGL00_____	Comment re fit to type?

COMMUNITY RANKING

1. CURRENT CONDITION and quality of the community itself.

- Comment on the species composition and biological structure of the community (species diversity, indicator species, development/maturity, etc.) For forests: Do you consider this to be old growth? If so, based on what?

- Natural and anthropogenic disturbance **within** the community (check off, then describe extent and how recent below)

● Logging – most recently c. __20+_____ yrs ago	☐ Animal effects (insect outbreaks, browsing)
☐ Agriculture / pasture	☐ Erosion
☐ Fire	☐ Dumping or Mining
☐ Wind or ice damage	● ORV / vehicle disturbance
☐ Impoundment	☐ Trails / roads
☐ Exotic plants	☐ Other, list

List disturbance(s): to what degree have these altered natural ecological processes, and/or do they appear to effect the population?
The surrounding area has been heavily logged, and is not dominated by regenerating spruce stands. The Jack Pine forest is primarily younger trees (<10 dbh), and in the past likely extended into another stand of Jack Pine approximately 500 ft to the west (See JACKPINE WOOD005DMC).

- ☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor).
- ☐ **B** – Some signs of human disturbance or degradation, but community generally intact.
- ● **C** – Signs of human disturbance or degradation, community compromised in some significant way.
- ☐ **D** – Highly disturbed (multiple impacts causing community to be drastically altered).

2. SIZE / QUALITY:

What is the approximate size of the community occurrence?_____2.8 acres_____ ● acres / ☐ hectares

☐ Covers the natural extent of this community type ● Has been truncated through adjacent land use

Size / Quality Rank: ☐ **A** – Excellent ☐ **B** – Good ● **C** – Fair ☐ **D** – Poor

3. LANDSCAPE CONTEXT of the area surrounding the community:

What land uses and/or natural communities surround the observed area? Describe the types and extent of anthropogenic disturbance **around** the observed area, and to what degree this may affect the observed community. To what degree can the observed community be protected from effects of adjacent land uses?

Upwards of 80% of the surrounding community has been directly impacted from logging activities. To the north, east and west, recent activities have cleared the pre-existing forest terrain, and the area is regenerating with mixed conifers, mainly spruce. To the south the Jack pine forest extends outside the survey area. From aerial imagery it appears the entire stand may encompass approximately 6 acres, though less than 3 acres is located within the project's survey area.

- ☐ **A** – Community surrounded by >= 1000 acres of undisturbed landscape.
- ☐ **B** – Community surrounded by fairly intact landscape, though there may be cuts nearby.
- ● **C** – Community surrounded by fragmented forest or rural landscape.
- ☐ **D** – Surrounding area developed.

OVERALL RANK for Community based on your experience ☐ **A** – Excellent ☐ **B** – Good ● **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank		☐ **A** – Excellent	☐ **B** – Good	☐ **C** – Fair	☐ **D** – Poor	☐ **E** – Extant
Date:	Reviewer:	Rationale:				

PART II (con't): VEGETATION DATA from PLOT SAMPLING (replacing spp lists on p. 2, in cases where plots are taken)

Community type:			EOnum:
LAYER	plot #		
TREE list species and dbh for all trees >= 10 cm dbh; *count standing dead as 1 species.* **note units:** QUAD SIZE: **note which size used** 5.64 m radius for 1/100th ha 7.98 m radius for 2/100th ha use same size throughout!			
DEADWOOD (use tree plot) LARGE: (> 10cm dia); measure length in plot & middle dia): LIST DOM. SPP (IF KNOWN) SMALL (< 10 cm diameter): **1**: < 5% **2**: 6-24% **3**: 25%+			
SAPLING cover class by species of: trees/shrubs > 3 m tall but < 10 cm dbh; PLOT SIZE: 2.8 m radius			
SHRUB cover class by species of woodies > 1 m tall but < 3 m tall; PLOT SIZE: 2.8 m radius			
HERB cover class* by species for all herbaceous plants plus any woodies < 1 m tall QUAD SIZE: 1 m^2 , 4 herb quads per tree plot. Enter individual cover values in right-hand columns Remember the zeros for spp present in some but not all herb quads.	*Species*	*Species*	*Species*
BRYOID ground-layer mosses, liverwort, lichens in herb quads. **resolution** (check one): __"moss"/"liverwort"/"lichen" only; __identified to major group ("peat mosses, broom mosses, feather mosses", etc.); __identified to genus; __identified to species.			
REMARKS:			

In box on p.3, list plant spp. present in the community but not in the sample plots so we have a complete species list.

* cover classes (record midpoint): < 2 **1** 2-5% **3** 6-12% **9** 13-24% **19** 25-49% **37** 50-74% **63** 75-100% **87**

Please send completed form to: Information Manager, Maine Natural Areas Program, State House Station #93, Augusta, ME 04330

NATURAL COMMUNITY SURVEY

Project New England Clean Energy Connect (NECEC)

I. IDENTIFIERS / LOCATION

Site Name: NECEC FID #11	**Obs. Pt. #: JACKPINEWOOD005DMC**	**Quadcode:**
Field-assigned Community Type: Jack Pine Forest Identification or classification difficulties? Describe: No issues with identification		USGS 7.5' Quad Name: Spencer Lake Quadrangle Town: Bradstreet Township T4 R7
MNAP REVIEWED/EdITED TYPE:	Occurrence #:	County: Somerset
LANDOWNER INFORMATION: for each landowner Map / Lot / Name (& address if new landowner)		Date: 7/18/18 Surveyors: Duane Choquette & Tom Errico SourceCode: F_____ Biophysical Region: Western Mountains

GPS Coordinates (**X**☐ NAD 83, UTM Zone 19N; ☐ Other-please specify) centerpoint Lat: 45.49638, Long: -70.25782

Directions to occurrence: From the Town of Jackman, Maine: Take State Route 201 south to Spencer Road. Spencer Road west to Moore Pond, Proceed north to Egg Pond. Jack Pine woodland is west-northwest of Egg pond, between egg pond and Bitter Brook.

● Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

FEATURE MAP. Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation. Locational uncertainty refers to any uncertainty there is as to where the actual observation occurred. Confidence extent indicates how confident you are that the observed area represents the full extent of the feature.

Locational Uncertainty:None

☐ Areal delimited

● Mapped to within 12.5 m of actual location

☐ Greater uncertainty (please indicate)

_____50_____ m / ft / km / miles

Confidence Extent:

☐ **Y** - Confident full extent of feature **IS** known

● **N** - Confident full extent is **NOT** known

☐ **?** - **Uncertain** whether full extent is known

GENERAL DESCRIPTION OF COMMUNITY(See instructions for guidelines):

Predominately Jack pine (90%), with mixed red pine and red spruce in the canopy. The understory is dry and open, with lowbush blueberries, laurels, and snowberries found sporadically in patches, with bracken fern present in areas where the canopy thins. The Jack Pine woodland abuts regenerating clear-cuts to both the east and west, which are dominated by young red spruce, though scattered young jack pines can be found throughout.

SAMPLE TYPE:	Additional sampling recommended?
____ Brief descriptive – **NOT SUFFICIENT FOR DOCUMENTING NEW EOs**	X Yes ☐ No
__X__ Generalized cover estimates & dbhs (p2)	Photos: X Yes ☐ No
____ Nested plot samples (N = _____) (attach)	

II. VEGETATION BY STRATA

Community name & EO#:

TREE LAYER (canopy plus emergents, everything ≥ 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% **70%** 80% 90+%

Total Basal Area: ft²/acre | Conifer %:100 | Canopy height _60ft_____ m or ft | Supercanopy spp?

Species name/code	Cover class*	Dbh range ☐in ☐ cm	Core ages	Species name/code	Cover class*	Dbh range ☐in ☐cm	Core ages	☐ check here if plot data are attached instead
Pinus banksiana	87	8-10						
Pinus strobus	1	8-10						
Picea rubens	9	6-8						
Pinus resinosa	1	6-8						

SAPLING / TALL SHRUB LAYER (> 3 m tall and < 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Picea rubens	19			
Pinus banksiana	63			

SHRUB LAYER (woody plants ~1 - 3 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Kalmia angustifolia	19			
Vaccinium angustifolium	19			

HERB / DWARF SHRUB LAYER (all herbaceous vascular plants plus any woody plants < 1 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE : tree regen___10_____%; shrub__10_____%; graminoid____0____%; forb___20____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Pteridium aquilinum	37			
Gaultheria procumbens	19			
Cornus canadensis	19			
Gaultheria hispidula	9			

BRYOID LAYER (all ground-layer non-vascular plants; do not include epiphytes)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE: bryophytes__100_____% lichens _____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Pleurozium schreberi	87			
Huperzia lucidula	9			

*cover classes (**midpoint**): < 2%= **1**, 2-5%= **3**, 6-12%= **9**, 13-24%= **19**, 25-49%= **37**, 50-74%= **63**, 75-100%= **87**

ADDITIONAL SPECIES within area where vegetation cover by strata were taken						OTHER PLANT SPP seen in community (spp codes), for complete plant species list
Stratum	Species code	Cover class	Stratum	Species code	Cover class	

III. ENVIRONMENTAL SETTING

Community name & EO#:

SOILS (rooting zone):

Sample #__005__

Depth to which soil examined___36 cm_____

Organic layer depth_____15_____cm or ☐ >1 m

Mineral layer below organic? ____yes___depth___21 cm_____

Mottling in top 30 cm?___No____depth_____

Depth to water table:__unknown_____

Depth to obstruction:__36 cm_____ nature of obstruction:____bedrock_____

Stoniness: ☐ very little (<1%)/ ● moderate (2-25%)/ ☐ very (>25%)

pH:__unknown_____ measured in ☐ soil or ☐ interstitial water

vonPost decomposition (peat substrates only) _____ at _____ deep

ELEVATION:1250ft

☐ m or ● ft?

ASPECT (TRUE): South

SLOPE : Include units! (45º = 100%)

10% = 25%

☐ measured ● estimated

HYDROLOGIC REGIME:

☐ upland

☐ nontidal wetland:
- ☐ perm flooded
- ☐ semiper flooded
- ☐ seasonally fld.
- ☐ saturated

☐ tidal – irreg. fld.
☐ tidal – reg. fld.
- ☐ saltwater
- ☐ brackish
- ☐ freshwater

☐ unknown

HABITAT PATCHINESS (describe zones or patches if present):

Dense central stand, outer edges border logging clearcuts with regenerating spuce being dominant.

MICROTOPOGRAPHY:

Jack Pine Forest is surrounded by regenerating clear cuts on West, North and East sides. A depression containing a Black spruce bog is located within the Jack Pine forest along the southern survey limit.

AVERAGE TEXTURE:

☐ gravel
☐ sand
● loamy sand / sandy loam
☐ loam
☐ silt loam
☐ clay loams
☐ sandy clay / clay
☐ peat
☐ muck

DRAINAGE & MOISTURE REGIME (see MAPPSS key):

☐ very poorly drained
☐ poorly drained
☐ somewhat poorly drained
☐ moderately well drained
☐ well drained
☐ somewhat excessively drained
☐ excessively drained

BEDROCK TYPE:

☐ Igneous
- ● granite
- ☐ dioritic
- ☐ gabbroic

☐ Metamorphic
- ☐ slate/phyllite
- ☐ schist/gneiss

☐ Sedimentary
- ☐ limestone
- ☐ other

details?

TOPOGRAPHIC POSITION

☐ D drainage channel
☐ P low plain, level
☐ N narrow valley
☐ T toe of slope
☐ L lower slope
● M middle slope
☐ T hillside terrace
☐ U upper slope
☐ E cliff/ledge
☐ S ridge, summit, crest

SURFICIAL DEPOSIT:

● bedrock
☐ talus slope
☐ glacial till
☐ moraine
☐ esker/outwash
☐ glacial delta
☐ lacustrine/fluvial
☐ marine
☐ aeolian
☐ other:

THREATS TO COMMUNITY? Logging

MANAGEMENT / PROTECTION NEEDS?

OTHER COMMENTS: animal use, species distribution notes, etc.
This Jack Pine Forest is located approximately 1500 ft west-northwest of Egg Pond, and extends both north and south from the survey area. In the Southern segment, the Jack Pine Forest surrounds a large depression containing a Black Spruce bog. Heavy logging has occurred to the east and west of the Jack Pine Forest, and scattered jack pine saplings can be found in these regenerating clear-cuts. The clear cuts are spruce dominant.

IV. SUMMARY AND RANKING

Community name & EO#:

Applicable National Type:	NVC CODE: CEGL00_____	Comment re fit to type?

COMMUNITY RANKING

1. CURRENT CONDITION and quality of the community itself.

- Comment on the species composition and biological structure of the community (species diversity, indicator species, development/maturity, etc.) For forests: Do you consider this to be old growth? If so, based on what?

- Natural and anthropogenic disturbance **within** the community (check off, then describe extent and how recent below)

☒ Logging – most recently c. __20+_____ yrs ago	☐ Animal effects (insect outbreaks, browsing)
☐ Agriculture / pasture	☐ Erosion
☐ Fire	☐ Dumping or Mining
☐ Wind or ice damage	☒ ORV / vehicle disturbance
☐ Impoundment	☒ Trails / roads
☐ Exotic plants	☐ Other, list

List disturbance(s): to what degree have these altered natural ecological processes, and/or do they appear to effect the population?
The surrounding area has been heavily logged, and is not dominated by regenerating spruce stands. The Jack Pine forest is primarily younger trees (<10 dbh), and in the past likely extended into another stand of Jack Pine approximately 500 ft to the west (See JACKPINE WOOD004DMC).

- ☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor).
- ☐ **B** – Some signs of human disturbance or degradation, but community generally intact.
- ☒ **C** – Signs of human disturbance or degradation, community compromised in some significant way.
- ☐ **D** – Highly disturbed (multiple impacts causing community to be drastically altered).

2. SIZE / QUALITY:

What is the approximate size of the community occurrence?_____4.7 acres_____ ☒ acres / ☐ hectares

☐ Covers the natural extent of this community type ☒ Has been truncated through adjacent land use

Size / Quality Rank: ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor

3. LANDSCAPE CONTEXT of the area surrounding the community:

What land uses and/or natural communities surround the observed area? Describe the types and extent of anthropogenic disturbance **around** the observed area, and to what degree this may affect the observed community. To what degree can the observed community be protected from effects of adjacent land uses?

Upwards of 80% of the surrounding community has been directly impacted from logging activities. To the north, east and west, recent activities have cleared the pre-existing forest terrain, and the area is regenerating with mixed conifers, mainly spruce. To the south the Jack pine forest extends outside the survey area. From aerial imagery it appears the entire stand may encompass approximately 20 acres, though less than 5 acres is located within the project's survey area.

- ☐ **A** – Community surrounded by >= 1000 acres of undisturbed landscape.
- ☒ **B** – Community surrounded by fairly intact landscape, though there may be cuts nearby.
- ☐ **C** – Community surrounded by fragmented forest or rural landscape.
- ☐ **D** – Surrounding area developed.

OVERALL RANK for Community ☐ **A** – Excellent ☐ **B** – Good ☒ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant
based on your experience
Comments:

MNAP reviewed / verified rank		☐ **A** – Excellent	☐ **B** – Good	☐ **C** – Fair	☐ **D** – Poor	☐ **E** – Extant
Date:	Reviewer:	Rationale:				

PART II (con't): VEGETATION DATA from PLOT SAMPLING (replacing spp lists on p. 2, in cases where plots are taken)

Community type:			EOnum:
LAYER	plot #		
TREE list species and dbh for all trees >= 10 cm dbh; *count standing dead as 1 species.* **note units:** QUAD SIZE: **note which size used** 5.64 m radius for 1/100th ha 7.98 m radius for 2/100th ha use same size throughout!			
DEADWOOD (use tree plot) LARGE: (> 10cm dia); measure length in plot & middle dia): LIST DOM. SPP (IF KNOWN) SMALL (< 10 cm diameter): **1**: < 5% **2**: 6-24% **3**: 25%+			
SAPLING cover class by species of: trees/shrubs > 3 m tall but < 10 cm dbh; PLOT SIZE: 2.8 m radius			
SHRUB cover class by species of woodies > 1 m tall but < 3 m tall; PLOT SIZE: 2.8 m radius			
HERB cover class* by species for all herbaceous plants plus any woodies < 1 m tall QUAD SIZE: 1 m^2 , 4 herb quads per tree plot. Enter individual cover values in right-hand columns Remember the zeros for spp present in some but not all herb quads.	*Species*	*Species*	*Species*
BRYOID ground-layer mosses, liverwort, lichens in herb quads. **resolution** (check one): __"moss"/"liverwort"/"lichen" only; __identified to major group ("peat mosses, broom mosses, feather mosses", etc.); __identified to genus; __identified to species.			
REMARKS:			

In box on p.3, list plant spp. present in the community but not in the sample plots so we have a complete species list.

* cover classes (record midpoint): < 2 **1** 2-5% **3** 6-12% **9** 13-24% **19** 25-49% **37** 50-74% **63** 75-100% **87**

Please send completed form to: Information Manager, Maine Natural Areas Program, State House Station #93, Augusta, ME 04330

I. IDENTIFIERS / LOCATION

Site Name: NECEC FID #12	**Obs. Pt. #: JACKPINEWOOD006DMC**	**Quadcode:**
Field-assigned Community Type: Jack Pine Forest Identification or classification difficulties? Describe: No issues with identification		USGS 7.5' Quad Name: Enchanted Pond Quadrangle Town: Bradstreet Township T4 R7
MNAP REVIEWED/EdITED TYPE:	Occurrence #:	County: Somerset
LANDOWNER INFORMATION: for each landowner Map | Lot | Name (& address if new landowner)		Date: 7/18/18 Surveyors: Duane Choquette & Tom Errico SourceCode: F_____ Biophysical Region: Western Mountains

GPS Coordinates (**X** NAD 83, UTM Zone 19N; ☐ Other-please specify) centerpoint Lat: 45.49638, Long: -70.25782

Directions to occurrence: From the Town of Jackman, Maine: Take State Route 201 south to Spencer Road. Spencer Road approximately 7 miles west. Turn north onto logging road and bear left. The road ends in a log landing at the start of the Jack Pone Forest. Proceed west into the Jack pine Forest.

● Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

FEATURE MAP. Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation. Locational uncertainty refers to any uncertainty there is as to where the actual observation occurred. Confidence extent indicates how confident you are that the observed area represents the full extent of the feature.

Locational Uncertainty:None

☐ Areal delimited

● Mapped to within 12.5 m of actual location

☐ Greater uncertainty (please indicate)

_____50_____ m / ft / km / miles

Confidence Extent:

☐ **Y** - Confident full extent of feature **IS** known

● **N** - Confident full extent is **NOT** known

☐ **?** - **Uncertain** whether full extent is known

GENERAL DESCRIPTION OF COMMUNITY(See instructions for guidelines):

Predominately Jack pine (70%), with mixed red pine, red spruce, and balsam fir in the canopy. The understory is dry and open, with brackenfern and bunchberry found throughout. The Jack Pine Forest is fairly extensive, extending outside of the survey area to the north and south. The Forest also spans a large alder-dominant stream valley and two smaller wetland seeps. The Jack Pine gives way to a spruce and fir dominant forest to the south. Sugar maples saplings appear sporadically in the understory in the western edge of the Jack Pine Forest.

SAMPLE TYPE:	Additional sampling recommended?
____ Brief descriptive – **NOT SUFFICIENT FOR DOCUMENTING NEW EOs**	X Yes ☐ No
__X__ Generalized cover estimates & dbhs (p2)	Photos: X Yes ☐ No
____ Nested plot samples (N = _____) (attach)	

II. VEGETATION BY STRATA

Community name & EO#:

TREE LAYER (canopy plus emergents, everything ≥ 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% **70%** 80% 90+%

Total Basal Area: ft²/acre | Conifer %:100 | Canopy height _80ft_____ m or ft | Supercanopy spp?

Species name/code	Cover class*	Dbh range ☐in ☐ cm	Core ages	Species name/code	Cover class*	Dbh range ☐in ☐cm	Core ages	☐ check here if plot data are attached instead
Pinus banksiana	87	10-14						
Pinus strobus	3	12-16						
Picea rubens	19	8-10						
Abies balsamea	9							

SAPLING / TALL SHRUB LAYER (> 3 m tall and < 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Picea rubens	19			
Pinus banksiana	37			
Abies balsamea	19			

SHRUB LAYER (woody plants ~1 - 3 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Kalmia angustifolia	3			
Vaccinium angustifolium	3			

HERB / DWARF SHRUB LAYER (all herbaceous vascular plants plus any woody plants < 1 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE : tree regen___10_____%; shrub__10_____%; graminoid____0____%; forb___20____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Pteridium aquilinum	37			
Gaultheria procumbens	19			
Cornus canadensis	37			
Gaultheria hispidula	9			

BRYOID LAYER (all ground-layer non-vascular plants; do not include epiphytes)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE: bryophytes__100_____% lichens _____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Pleurozium schreberi	87			
Huperzia lucidula	9			

*cover classes (**midpoint**): < 2%= **1**, 2-5%= **3**, 6-12%= **9**, 13-24%= **19**, 25-49%= **37**, 50-74%= **63**, 75-100%= **87**

ADDITIONAL SPECIES within area where vegetation cover by strata were taken

Stratum	Species code	Cover class	Stratum	Species code	Cover class

OTHER PLANT SPP seen in community (spp codes), for complete plant species list

III. ENVIRONMENTAL SETTING

Community name & EO#:

SOILS (rooting zone):

Sample #__006__

Depth to which soil examined___45 cm_____

Organic layer depth_____18_____cm or ☐ >1 m

Mineral layer below organic? ____yes___depth___27 cm_____

Mottling in top 30 cm?___No____depth_____

Depth to water table:__unknown_____

Depth to obstruction:__None_encountered_____ nature of obstruction:____ _____

Stoniness: ☐ very little (<1%)/ ● moderate (2-25%)/ ☐ very (>25%)

pH:__unknown_____ measured in ☐ soil or ☐ interstitial water

vonPost decomposition (peat substrates only) _____ at _____ deep

ELEVATION:1240ft

☐ m or ● ft?

ASPECT (TRUE): northwest

SLOPE : Include units! (45º = 100%)

10% = 25%

☐ measured ● estimated

HYDROLOGIC REGIME:

● upland

☐ nontidal wetland:
- ☐ perm flooded
- ☐ semiper flooded
- ☐ seasonally fld.
- ● saturated

☐ tidal – irreg. fld.
☐ tidal – reg. fld.
- ☐ saltwater
- ☐ brackish
- ● freshwater

☐ unknown

Stream valley and seepage wetlands within Forest.

HABITAT PATCHINESS (describe zones or patches if present):

Large Jack Pine stand located between Horse Brook and one of its tributaries to the east. The Jack pine Forest convert to a spruce and fir forest to the south, and a spruce, fir and sugar maple forest to the west.

MICROTOPOGRAPHY:

Jack Pine Forest is mid-slope on a northwestern facing hillside, and descends in elevation on both the eastern and western sides as it descends into stream valleys.

AVERAGE TEXTURE:

- ☐ gravel
- ☐ sand
- ● loamy sand / sandy loam
- ☐ loam
- ☐ silt loam
- ☐ clay loams
- ☐ sandy clay / clay
- ☐ peat
- ☐ muck

DRAINAGE & MOISTURE REGIME (see MAPPSS key):

- ☐ very poorly drained
- ☐ poorly drained
- ☐ somewhat poorly drained
- ☐ moderately well drained
- ☐ well drained
- ☐ somewhat excessively drained
- ☐ excessively drained

BEDROCK TYPE:

☐ Igneous
- ● granite
- ☐ dioritic
- ☐ gabbroic

☐ Metamorphic
- ☐ slate/phyllite
- ☐ schist/gneiss

☐ Sedimentary
- ☐ limestone
- ☐ other

details?

TOPOGRAPHIC POSITION

- ☐ D drainage channel
- ☐ P low plain, level
- ☐ N narrow valley
- ☐ T toe of slope
- ☐ L lower slope
- ● M middle slope
- ☐ T hillside terrace
- ☐ U upper slope
- ☐ E cliff/ledge
- ☐ S ridge, summit, crest

SURFICIAL DEPOSIT:

- ● bedrock
- ☐ talus slope
- ☐ glacial till
- ☐ moraine
- ☐ esker/outwash
- ☐ glacial delta
- ☐ lacustrine/fluvial
- ☐ marine
- ☐ aeolian
- ☐ other:

THREATS TO COMMUNITY? Logging

MANAGEMENT / PROTECTION NEEDS?

OTHER COMMENTS: animal use, species distribution notes, etc.
This community is located on triangular swath of habitat bounded on the south by a spruce/fir forest bordering Spencer Road, the northwestern side by Horde Brook and on the northeastern side by an unnamed tributary of Horse Brook. The site drain northward and into the Moose river.

IV. SUMMARY AND RANKING

Community name & EO#:

Applicable National Type:	NVC CODE: CEGL00_____	Comment re fit to type?

COMMUNITY RANKING

1. CURRENT CONDITION and quality of the community itself.

- Comment on the species composition and biological structure of the community (species diversity, indicator species, development/maturity, etc.) For forests: Do you consider this to be old growth? If so, based on what?

- Natural and anthropogenic disturbance **within** the community (check off, then describe extent and how recent below)

● Logging – most recently c. __30+_____ yrs ago	☐ Animal effects (insect outbreaks, browsing)
☐ Agriculture / pasture	☐ Erosion
☐ Fire	☐ Dumping or Mining
☐ Wind or ice damage	● ORV / vehicle disturbance
☐ Impoundment	☐ Trails / roads
☐ Exotic plants	☐ Other, list

List disturbance(s): to what degree have these altered natural ecological processes, and/or do they appear to effect the population?
The surrounding area has been heavily logged, and is not dominated by regenerating spruce stands. The Jack Pine forest is primarily younger trees (<10 dbh), and in the past likely extended into another stand of Jack Pine approximately 500 ft to the west (See JACKPINE WOOD005DMC).

- ☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor).
- ☐ **B** – Some signs of human disturbance or degradation, but community generally intact.
- ● **C** – Signs of human disturbance or degradation, community compromised in some significant way.
- ☐ **D** – Highly disturbed (multiple impacts causing community to be drastically altered).

2. SIZE / QUALITY:

What is the approximate size of the community occurrence?_____11.4 acres_____ ● ☐ acres / ☐ hectares

☐ Covers the natural extent of this community type ● ☐ Has been truncated through adjacent land use

Size / Quality Rank: ☐ **A** – Excellent ● ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

3. LANDSCAPE CONTEXT of the area surrounding the community:

What land uses and/or natural communities surround the observed area? Describe the types and extent of anthropogenic disturbance **around** the observed area, and to what degree this may affect the observed community. To what degree can the observed community be protected from effects of adjacent land uses?

This natural community is located between two large stream valleys. Logging activities have heavily impacted the surrounding area, but a large contingent of Jack Pine Forest remains. To the south the Jack pine forest extends outside the survey area.

- ☐ **A** – Community surrounded by >= 1000 acres of undisturbed landscape.
- ● ☐ **B** – Community surrounded by fairly intact landscape, though there may be cuts nearby.
- ☐ **C** – Community surrounded by fragmented forest or rural landscape.
- ☐ **D** – Surrounding area developed.

OVERALL RANK for Community based on your experience ☐ **A** – Excellent ☐ **B** – Good ● ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank		☐ **A** – Excellent	☐ **B** – Good	☐ **C** – Fair	☐ **D** – Poor	☐ **E** – Extant
Date:	Reviewer:	Rationale:				

PART II (con't): VEGETATION DATA from PLOT SAMPLING (replacing spp lists on p. 2, in cases where plots are taken)

Community type:			EOnum:
LAYER	plot #		
TREE list species and dbh for all trees >= 10 cm dbh; *count standing dead as 1 species.* **note units:** QUAD SIZE: **note which size used** 5.64 m radius for 1/100th ha 7.98 m radius for 2/100th ha use same size throughout!			
DEADWOOD (use tree plot) LARGE: (> 10cm dia); measure length in plot & middle dia): LIST DOM. SPP (IF KNOWN) SMALL (< 10 cm diameter): **1**: < 5% **2**: 6-24% **3**: 25%+			
SAPLING cover class by species of: trees/shrubs > 3 m tall but < 10 cm dbh; PLOT SIZE: 2.8 m radius			
SHRUB cover class by species of woodies > 1 m tall but < 3 m tall; PLOT SIZE: 2.8 m radius			
HERB cover class* by species for all herbaceous plants plus any woodies < 1 m tall QUAD SIZE: 1 m^2 , 4 herb quads per tree plot. Enter individual cover values in right-hand columns Remember the zeros for spp present in some but not all herb quads.	*Species*	*Species*	*Species*
BRYOID ground-layer mosses, liverwort, lichens in herb quads. **resolution** (check one): __"moss"/"liverwort"/"lichen" only; __identified to major group ("peat mosses, broom mosses, feather mosses", etc.); __identified to genus; __identified to species.			
REMARKS:			

In box on p.3, list plant spp. present in the community but not in the sample plots so we have a complete species list.

* cover classes (record midpoint): < 2 **1** 2-5% **3** 6-12% **9** 13-24% **19** 25-49% **37** 50-74% **63** 75-100% **87**

Please send completed form to: Information Manager, Maine Natural Areas Program, State House Station #93, Augusta, ME 04330

NATURAL COMMUNITY SURVEY

Project _____

I. IDENTIFIERS / LOCATION

Site Name: Livermore Falls Upper Floodplain Hardwood Forest	**Obs. Pt. #:**	**Quadcode:**
Field-assigned Community Type: Upper Floodplain Hardwood Forest Identification or classification difficulties? Describe: Does not completely comport with description, although topographic position is appropriate, and the site is hardwood dominated.		USGS 7.5' Quad Name: Livermore Falls Town: Livermore Falls
MNAP REVIEWED/EdITED TYPE:	Occurrence #:	County: Androscoggin
LANDOWNER INFORMATION: for each landowner Map | Lot | Name (& address if new landowner)		Date: 7/7/18 Surveyors: A. Gilman SourceCode: F_____ Biophysical Region:

GPS Coordinates (☒ NAD 83, UTM Zone 19N; ☐ Other-please specify) Lat. 44.403416, Long. -70.148538

Directions to occurrence:

☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

FEATURE MAP. Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation. Locational uncertainty refers to any uncertainty there is as to where the actual observation occurred. Confidence extent indicates how confident you are that the observed area represents the full extent of the feature.

Locational Uncertainty:

☐ Areal delimited

☐ Mapped to within 12.5 m of actual location

☐ Greater uncertainty (please indicate)

_____50_____ m / ft / km / miles

Confidence Extent:

☐ **Y** - Confident full extent of feature **IS** known

☐ **N** - Confident full extent is **NOT** known

☐ **?** - **Uncertain** whether full extent is known

GENERAL DESCRIPTION OF COMMUNITY(See instructions for guidelines):

The community is dominated by red oak, yellow birch, white ash, and red maple, with minor component of black cherry. "Rich forest" components" such as sugar maple and basswood are not importantly represented but note the presence of at least oe butternut tree. (Also note the lack of silver maple or cottonwood). Many trees are of large size (ca.14" – 16") and there is good forest structure. Shrubs are nearly lacking (a few speckled alder). The understory comprises mainly ferns: Sensitive fern, interrupted fern, and lady fern are most prominent, with a few ostrich fern present.

The site is nearly level and the community occurs slightly up-gradient and down-gradient of the delineated wetland boundary. Slightly to the south a stream enters from the east, and the canopy opens to a high-herb streamside community. Beyond that, there is general floodplain forest. To the north, the community is bounded by rising terrain and mixed forest on sand deposits.

The community was not investigate further west (towards River Road) than the NENEC project study area. Note this area was previously mapped (by the same investigator) as "maple-basswood floodplain forest" but basswood is now not apparent.

SAMPLE TYPE:	Additional sampling recommended?
__X__ Brief descriptive – **NOT SUFFICIENT FOR DOCUMENTING NEW EOs** ____ Generalized cover estimates & dbhs (p2) ____ Nested plot samples (N = _____) (attach)	☐ Yes ☐ No Photos: ☐ Yes ☐ No

II. VEGETATION BY STRATA

Community name & EO#:

TREE LAYER (canopy plus emergents, everything ≥ 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Total Basal Area: ft²/acre NC

Conifer %:0

Canopy height ____40___m or ft

Supercanopy spp? No

Species name/code	Cover class*	Dbh range ☒in ☐cm	Core ages	Species name/code	Cover class*	Dbh range ☐in ☐cm	Core ages
Querus rubra	19	12”-16”+	NA				
Betula allegh	19	12”-16”	NA				
Acer rubrum	37	10”-15”	NA				

☐ **check here if plot data are attached instead**

SAPLING / TALL SHRUB LAYER (> 3 m tall and < 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*
NA			

check here if plot data are attached instead ☐

SHRUB LAYER (woody plants ~1 - 3 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*
NA			

check here if plot data are attached instead ☐

HERB / DWARF SHRUB LAYER (all herbaceous vascular plants plus any woody plants < 1 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE : tree regen_____%; shrub_____%; graminoid____0____%; forb___75____%

Species name/code	Cover class*	Species name/code	Cover class*
Onoclea sensibilis	19		
Athyrium angustum	19		
Osumnda claytoniana	19		
		No spring ephemerals were observed due to mid-summer site visit.	

check here if plot data are attached instead ☐

BRYOID LAYER (all ground-layer non-vascular plants; do not include epiphytes)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE: bryophytes_____<5%____% lichens ____0____%

Species name/code	Cover class*	Species name/code	Cover class*
No observed			

check here if plot data are attached instead ☐

*cover classes (**midpoint**): < 2%= **1**, 2-5%= **3**, 6-12%= **9**, 13-24%= **19**, 25-49%= **37**, 50-74%= **63**, 75-100%= **87**

ADDITIONAL SPECIES within area where vegetation cover by strata were taken

Stratum	Species code	Cover class	Stratum	Species code	Cover class

OTHER PLANT SPP seen in community (spp codes), for complete plant species list

Dryopteris carthusiana

III. ENVIRONMENTAL SETTING

Community name & EO#:

SOILS (rooting zone):

Sample #____

Depth to which soil examined____NA (soils not examined)____

Organic layer depth_____cm or ☐ >1 m

Mineral layer below organic? _____depth_____

Mottling in top 30 cm?_____depth_____

Depth to water table:_____

Depth to obstruction:_____ nature of obstruction:_____

Stoniness: ☐ very little (<1%)/ ☐ moderate (2-25%)/ ☐ very (>25%)

pH:_____ measured in ☐ soil or ☐ interstitial water

vonPost decomposition (peat substrates only) _____ at _____ deep

AVERAGE TEXTURE:

- ☐ gravel
- ☐ sand
- ☐ loamy sand / sandy loam
- ☐ loam
- ☐ silt loam
- ☐ clay loams
- ☐ sandy clay / clay
- ☐ peat
- ☐ muck

DRAINAGE & MOISTURE REGIME (see MAPPSS key):

- ☐ very poorly drained
- ☐ poorly drained
- ☐ somewhat poorly drained
- ☐ moderately well drained
- ☐ well drained
- ☐ somewhat excessively drained
- ☐ excessively drained

ELEVATION: 290 ft

☐ m or ☒ ft?

ASPECT (TRUE):

SLOPE : Include units! (45º = 100%)

0%-2%, estimated

☐ measured ☒ estimated

HYDROLOGIC REGIME:

- ☒ upland
- ☒ nontidal wetland:
  - ☐ perm flooded
  - ☐ semiper flooded
  - ☒ seasonally fld.
  - ☐ saturated
- ☐ tidal – irreg. fld.
- ☐ tidal – reg. fld.
  - ☐ saltwater
  - ☐ brackish
  - ☐ freshwater
- ☐ unknown

HABITAT PATCHINESS (describe zones or patches if present): Fairly uniform

MICROTOPOGRAPHY: NA

BEDROCK TYPE:

- ☐ Igneous
  - ☐ granite
  - ☐ dioritic
  - ☐ gabbroic
- ☐ Metamorphic
  - ☐ slate/phyllite
  - ☐ schist/gneiss
- ☐ Sedimentary
  - ☐ limestone
  - ☐ other

details? Limy marine shale

TOPOGRAPHIC POSITION

- ☐ D drainage channel
- ☒ P low plain, level
- ☐ N narrow valley
- ☐ T toe of slope
- ☐ L lower slope
- ☐ M middle slope
- ☐ T hillside terrace
- ☐ U upper slope
- ☐ E cliff/ledge
- ☐ S ridge, summit, crest

SURFICIAL DEPOSIT:

- ☐ bedrock
- ☐ talus slope
- ☐ glacial till
- ☐ moraine
- ☐ esker/outwash
- ☐ glacial delta
- ☒ lacustrine/fluvial
- ☐ marine
- ☐ aeolian
- ☐ other:

THREATS TO COMMUNITY?

MANAGEMENT / PROTECTION NEEDS?

OTHER COMMENTS: animal use, species distribution notes, etc.

This community is a fairly small patch but is mature and has well-developed forest structure; there are few invasives.

IV. SUMMARY AND RANKING

Community name & EO#: Hardwood river terrace forest /Upper floodplain hardwood forest

Applicable National Type:	NVC CODE: CEGL00_____	Comment re fit to type?

COMMUNITY RANKING

1. CURRENT CONDITION and quality of the community itself.

- Comment on the species composition and biological structure of the community (species diversity, indicator species, development/maturity, etc.) For forests: Do you consider this to be old growth? If so, based on what?

  Not particularly enriched (no sugar maple, little basswood); nor particularly diverse (due to shading) but spring ephemeral community not assessed; not old growth although mature.

- Natural and anthropogenic disturbance **within** the community (check off, then describe extent and how recent below)

☐ Logging – most recently c. _____ yrs ago
☐ Agriculture / pasture
☐ Fire
☐ Wind or ice damage
☐ Impoundment
☐ Exotic plants
☐ Animal effects (insect outbreaks, browsing)
☐ Erosion
☐ Dumping or Mining
☐ ORV / vehicle disturbance
☐ Trails / roads
☐ Other, list: Adjacent powerline corridor; snowmobile trail, otherwise seems fairly intact.

List disturbance(s): to what degree have these altered natural ecological processes, and/or do they appear to effect the population?

☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor).
☐ **B** – Some signs of human disturbance or degradation, but community generally intact.
☐ **C** – Signs of human disturbance or degradation, community compromised in some significant way.
☐ **D** – Highly disturbed (multiple impacts causing community to be drastically altered).

2. SIZE / QUALITY:

What is the approximate size of the community occurrence?_____2-3_____ ☐ acres / ☐ hectares

☐ Covers the natural extent of this community type ☐ Has been truncated through adjacent land use

Size / Quality Rank: ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

3. LANDSCAPE CONTEXT of the area surrounding the community:

What land uses and/or natural communities surround the observed area? Describe the types and extent of anthropogenic disturbance **around** the observed area, and to what degree this may affect the observed community. To what degree can the observed community be protected from effects of adjacent land uses?
Powerline; road (west); not fully assessed due to limited study area.

☐ **A** – Community surrounded by >= 1000 acres of undisturbed landscape.
☐ **B** – Community surrounded by fairly intact landscape, though there may be cuts nearby.
☐ **C** – Community surrounded by fragmented forest or rural landscape.
☐ **D** – Surrounding area developed.

OVERALL RANK for Community ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant
based on your experience
Comments: Small size, does not comport 100% with published description, not enriched.

MNAP reviewed / verified rank		☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant
Date:	Reviewer:	Rationale:

PART II (con't): VEGETATION DATA from PLOT SAMPLING (replacing spp lists on p. 2, in cases where plots are taken)

Community type:			EOnum:
LAYER	plot #		
TREE list species and dbh for all trees >= 10 cm dbh; *count standing dead as 1 species.* **note units:** QUAD SIZE: **note which size used** 5.64 m radius for 1/100th ha 7.98 m radius for 2/100th ha use same size throughout!			
DEADWOOD (use tree plot) LARGE: (> 10cm dia); measure length in plot & middle dia): LIST DOM. SPP (IF KNOWN) SMALL (< 10 cm diameter): **1**: < 5% **2**: 6-24% **3**: 25%+			
SAPLING cover class by species of: trees/shrubs > 3 m tall but < 10 cm dbh; PLOT SIZE: 2.8 m radius			
SHRUB cover class by species of woodies > 1 m tall but < 3 m tall; PLOT SIZE: 2.8 m radius			
HERB cover class* by species for all herbaceous plants plus any woodies < 1 m tall QUAD SIZE: 1 m^2 , 4 herb quads per tree plot. Enter individual cover values in right-hand columns Remember the zeros for spp present in some but not all herb quads.	*Species*	*Species*	*Species*
BRYOID ground-layer mosses, liverwort, lichens in herb quads. **resolution** (check one): __"moss"/"liverwort"/"lichen" only; __identified to major group ("peat mosses, broom mosses, feather mosses", etc.); __identified to genus; __identified to species.			
REMARKS:			

In box on p.3, list plant spp. present in the community but not in the sample plots so we have a complete species list.

* cover classes (record midpoint): < 2 **1** 2-5% **3** 6-12% **9** 13-24% **19** 25-49% **37** 50-74% **63** 75-100% **87**

Please send completed form to: Information Manager, Maine Natural Areas Program, State House Station #93, Augusta, ME 04330

NATURAL COMMUNITY SURVEY

Project _____

I. IDENTIFIERS / LOCATION

Site Name: North Anson River Terrace Hardwood /Upper Floodplain Hardwood Forest	**Obs. Pt. #:**	**Quadcode:**
Field-assigned Community Type: As above Identification or classification difficulties? Describe: Does not completely comport with description, although topographic position is appropriate and the site is hardwood dominated.		USGS 7.5' Quad Name: Madison West Town: Anson
MNAP REVIEWED/EdITED TYPE:	Occurrence #:	County: Somerset
LANDOWNER INFORMATION: for each landowner Map | Lot | Name (& address if new landowner)		Date: 27 July 2018 Surveyors: A. V. Gilman SourceCode: F_____ Biophysical Region:

GPS Coordinates (☒ NAD 83, UTM Zone 19N; ☐ Other-please specify) Lat. 44.853352, Long. -69.886138

Directions to occurrence:
Park under CMP powerlines on Madison Street, north of the Carrabasset Stream, and follow powerlines S across an agricultural field (in corn in 2018) to riverside; community is on the W side of the powerlines between the cornfield and the river.

☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

FEATURE MAP. Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation. Locational uncertainty refers to any uncertainty there is as to where the actual observation occurred. Confidence extent indicates how confident you are that the observed area represents the full extent of the feature.

Locational Uncertainty:
- ☒ Areal delimited
- ☐ Mapped to within 12.5 m of actual location
- ☐ Greater uncertainty (please indicate)

_____50_____ m / ft / km / miles

Confidence Extent:
- ☐ **Y** - Confident full extent of feature **IS** known
- ☒ **N** - Confident full extent is **NOT** known
- ☐ **?** - **Uncertain** whether full extent is known

GENERAL DESCRIPTION OF COMMUNITY(See instructions for guidelines):

The community is on an upper terrace associated with Carrabasset Stream not for above its confluence with the Kennebec River (and likely back-flooded from the river at extremes). The riverside terrace is silver maple floodplain forest; this area is slightly upgradient and has a different community that is dominated by green ash and red oak with minor component of elm. The age structure is young except for a few large red oak and green ash. It is not an enriched community.

The forest is rather heavily invaded by invasive honeysuckles (much more so than when observed by the same surveyor in 2007); these comprise an understory of about 40%-50% cover overall. Understory herbs are typical, but lack elements of richness such as blue cohosh, wild leek, etc.

It is bounded south by silver maple floodplain forest, a narrow strip along river's edge (in the surveyor's judgement too narrow to consider as a natural community although containing some typically large trees). It is bounded north by cornfield

Note, as can be seen on aerial photos, the overall canopy is of small trees, vs. areas of larger trees upstream on the N side of the Carrabasset River.

SAMPLE TYPE:	Additional sampling recommended?
____ Brief descriptive – **NOT SUFFICIENT FOR DOCUMENTING NEW EOs** __X_ Generalized cover estimates & dbhs (p2) ____ Nested plot samples (N = _____) (attach)	☐ Yes ☒ No Photos: ☐ Yes ☐ No

II. VEGETATION BY STRATA

Community name & EO#:

TREE LAYER (canopy plus emergents, everything ≥ 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Total Basal Area: ft²/acre NC | Conifer %:0 | Canopy height ____40'___m or ft | Supercanopy spp? 50', Quercus rubra

Species name/code	Cover class*	Dbh range ☒in ☐cm	Core ages	Species name/code	Cover class*	Dbh range ☐in ☐cm	Core ages	☐ check here if plot data are attached instead
Quercus rubra	9	20"-24"						
Fraxinus penns	63	8"-14"						
Ulmus americana	9	3"-16"						
At field edge: one basswood, some black cherry; on slightly higher elevation.								

SAPLING / TALL SHRUB LAYER (> 3 m tall and < 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Ulmus americana	3			
Fraxinus pensilvanica	3			

SHRUB LAYER (woody plants ~1 - 3 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Lonicera cf. morrowii	37			

HERB / DWARF SHRUB LAYER (all herbaceous vascular plants plus any woody plants < 1 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE : tree regen_____%; shrub_____%; graminoid____0____%; forb___75____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Onoclea sensibilis	19	Rosa multiflora	1	
Athyrium angustum	3			
Matteuccia struthiopteris	9	Note absence: cinnamon fern,		
Circaea canadensis	1	Interrupted fern		
Viola pensylvanica	1			
Solidago flexicaulis	1			
Geum canadense	1			
Carex cf. blanda	1			
		No spring ephemerals were observed due to mid-summer site visit.		

BRYOID LAYER (all ground-layer non-vascular plants; do not include epiphytes)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE: bryophytes_____<5%____% lichens ____0____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if
None observed				

				plot data are attached instead ☐

*cover classes (**midpoint**): < 2%= **1**, 2-5%= **3**, 6-12%= **9**, 13-24%= **19**, 25-49%= **37**, 50-74%= **63**, 75-100%= **87**

ADDITIONAL SPECIES within area where vegetation cover by strata were taken

Stratum	Species code	Cover class	Stratum	Species code	Cover class

OTHER PLANT SPP seen in community (spp codes), for complete plant species list

Black cherry

III. ENVIRONMENTAL SETTING

Community name & EO#:

SOILS (rooting zone):

Sample #____

Depth to which soil examined____NA (soils not examined)____

Organic layer depth_____cm or ☐ >1 m

Mineral layer below organic? _____depth_____

Mottling in top 30 cm?_____depth_____

Depth to water table:_____

Depth to obstruction:_____ nature of obstruction:_____

Stoniness: ☐ very little (<1%)/ ☐ moderate (2-25%)/ ☐ very (>25%)

pH:_____ measured in ☐ soil or ☐ interstitial water

vonPost decomposition (peat substrates only) _____ at _____ deep

AVERAGE TEXTURE:

- ☐ gravel
- ☐ sand
- ☐ loamy sand / sandy loam
- ☐ loam
- ☐ silt loam
- ☐ clay loams
- ☐ sandy clay / clay
- ☐ peat
- ☐ muck

DRAINAGE & MOISTURE REGIME (see MAPPSS key):

- ☐ very poorly drained
- ☐ poorly drained
- ☐ somewhat poorly drained
- ☐ moderately well drained
- ☐ well drained
- ☐ somewhat excessively drained
- ☐ excessively drained

ELEVATION: 250 ft

☐ m or ☒ ft?

ASPECT (TRUE):

SLOPE : Include units! (45º = 100%)

0%-2%, estimated

☐ measured ☒ estimated

HYDROLOGIC REGIME:

- ☒ upland
- ☒ nontidal wetland:
  - ☐ perm flooded
  - ☐ semiper flooded
  - ☒ seasonally fld.
  - ☐ saturated
- ☐ tidal – irreg. fld.
- ☐ tidal – reg. fld.
  - ☐ saltwater
  - ☐ brackish
  - ☐ freshwater
- ☐ unknown

HABITAT PATCHINESS (describe zones or patches if present): Fairly uniform

MICROTOPOGRAPHY: generally level, with low ridges parallel to stream; rises gently to field.

BEDROCK TYPE:

- ☐ Igneous
  - ☐ granite
  - ☐ dioritic
  - ☐ gabbroic
- ☐ Metamorphic
  - ☐ slate/phyllite
  - ☐ schist/gneiss
- ☐ Sedimentary
  - ☐ limestone
  - ☐ other

details? Limy marine shale

TOPOGRAPHIC POSITION

- ☐ D drainage channel
- ☒ P low plain, level
- ☐ N narrow valley
- ☐ T toe of slope
- ☐ L lower slope
- ☐ M middle slope
- ☐ T hillside terrace
- ☐ U upper slope
- ☐ E cliff/ledge
- ☐ S ridge, summit, crest

SURFICIAL DEPOSIT:

- ☐ bedrock
- ☐ talus slope
- ☐ glacial till
- ☐ moraine
- ☐ esker/outwash
- ☐ glacial delta
- ☒ lacustrine/fluvial
- ☐ marine
- ☐ aeolian
- ☐ other:

THREATS TO COMMUNITY?

MANAGEMENT / PROTECTION NEEDS?

OTHER COMMENTS: animal use, species distribution notes, etc.

This c

IV. SUMMARY AND RANKING

Community name & EO#: Hardwood river terrace forest /Upper floodplain hardwood forest

Applicable National Type:	NVC CODE: CEGL00_____	Comment re fit to type?

COMMUNITY RANKING

1. CURRENT CONDITION and quality of the community itself.

- Comment on the species composition and biological structure of the community (species diversity, indicator species, development/maturity, etc.) For forests: Do you consider this to be old growth? If so, based on what?

  Not particularly enriched (no sugar maple, little basswood); nor particularly diverse (due to shading) but spring ephemeral community not assessed; forest is young; not old growth.

- Natural and anthropogenic disturbance **within** the community (check off, then describe extent and how recent below)

☐ Logging – most recently c. _____ yrs ago
☐ Agriculture / pasture
☐ Fire
☐ Wind or ice damage
☐ Impoundment
☐ Exotic plants
☐ Animal effects (insect outbreaks, browsing)
☐ Erosion
☐ Dumping or Mining
☐ ORV / vehicle disturbance
☐ Trails / roads
☐ Other, list: Adjacent powerline corridor; adjacent farm field

List disturbance(s): to what degree have these altered natural ecological processes, and/or do they appear to effect the population?

Quite invaded by honeysuckle; this may affect soil pH. quality and structure, and may limit regeneration of hardwood trees.

☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor).
☐ **B** – Some signs of human disturbance or degradation, but community generally intact.
☐ **C** – Signs of human disturbance or degradation, community compromised in some significant way.
☐ **D** – Highly disturbed (multiple impacts causing community to be drastically altered).

2. SIZE / QUALITY:

What is the approximate size of the community occurrence?_____7 acres___ ☐ acres / ☐ hectares

(Exclusive of lands E, and exclusive of an island W). Only observed in the project study area.

☐ Covers the natural extent of this community type ☐ Has been truncated through adjacent land use

Size / Quality Rank: ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

3. LANDSCAPE CONTEXT of the area surrounding the community:

What land uses and/or natural communities surround the observed area? Describe the types and extent of anthropogenic disturbance **around** the observed area, and to what degree this may affect the observed community. To what degree can the observed community be protected from effects of adjacent land uses?
Powerline; farmland; not fully assessed due to limited study area. There appear to be larger communities both upstream and down.

☐ **A** – Community surrounded by >= 1000 acres of undisturbed landscape.
☐ **B** – Community surrounded by fairly intact landscape, though there may be cuts nearby.
☐ **C** – Community surrounded by fragmented forest or rural landscape.
☐ **D** – Surrounding area developed.

OVERALL RANK for Community ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant
based on your experience
Comments: Does not fully comport with published description (too much green ash, lack of diversity), young age, invaded by honeysuckle

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant
Date: Reviewer: Rationale:

PART II (con't): VEGETATION DATA from PLOT SAMPLING (replacing spp lists on p. 2, in cases where plots are taken)

Community type:			EOnum:
LAYER	plot #		
TREE list species and dbh for all trees >= 10 cm dbh; *count standing dead as 1 species.* **note units:** QUAD SIZE: **note which size used** 5.64 m radius for 1/100th ha 7.98 m radius for 2/100th ha use same size throughout!			
DEADWOOD (use tree plot) LARGE: (> 10cm dia); measure length in plot & middle dia): LIST DOM. SPP (IF KNOWN) SMALL (< 10 cm diameter): **1**: < 5% **2**: 6-24% **3**: 25%+			
SAPLING cover class by species of: trees/shrubs > 3 m tall but < 10 cm dbh; PLOT SIZE: 2.8 m radius			
SHRUB cover class by species of woodies > 1 m tall but < 3 m tall; PLOT SIZE: 2.8 m radius			
HERB cover class* by species for all herbaceous plants plus any woodies < 1 m tall QUAD SIZE: 1 m^2 , 4 herb quads per tree plot. Enter individual cover values in right-hand columns Remember the zeros for spp present in some but not all herb quads.	*Species*	*Species*	*Species*
BRYOID ground-layer mosses, liverwort, lichens in herb quads. **resolution** (check one): __"moss"/"liverwort"/"lichen" only; __identified to major group ("peat mosses, broom mosses, feather mosses", etc.); __identified to genus; __identified to species.			
REMARKS:			

In box on p.3, list plant spp. present in the community but not in the sample plots so we have a complete species list.

* cover classes (record midpoint): < 2 **1** 2-5% **3** 6-12% **9** 13-24% **19** 25-49% **37** 50-74% **63** 75-100% **87**

Please send completed form to: Information Manager, Maine Natural Areas Program, State House Station #93, Augusta, ME 04330

NATURAL COMMUNITY SURVEY

Project _____

I. IDENTIFIERS / LOCATION

Site Name: Robinson's Way Hardwood Community	**Obs. Pt. #:**	**Quadcode:**
Field-assigned Community Type: Enriched Hardwood Forest Identification or classification difficulties? Describe: Forest matches natural community description. It IS partially within a delineated wetland, which required review of both forested wetland and upland community types		USGS 7.5' Quad Name: The Forks Town: Moxie Gore
MNAP REVIEWED/EdITED TYPE:	Occurrence #:	County: Somerset
LANDOWNER INFORMATION: for each landowner Map / Lot / Name (& address if new landowner)		Date: 7/26/18 Surveyors: M. Lin SourceCode: F_____ Biophysical Region:

GPS Coordinates (☒ NAD 83, UTM Zone 19N; ☐ Other-please specify) Lat. 45.35697517, Long. -69.89488551

Directions to occurrence: Enriched Hardwood community is located between Robinson's Way and Moxie Lake Road. The community is just east of Robinson's Way and approximately 0.2 mile north of Moxie Lake Road. The community extended south, beyond the Project Area delineated for the survey effort

☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

FEATURE MAP. Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation. Locational uncertainty refers to any uncertainty there is as to where the actual observation occurred. Confidence extent indicates how confident you are that the observed area represents the full extent of the feature.

Locational Uncertainty:

☐ Areal delimited

☒ Mapped to within 12.5 m of actual location

☐ Greater uncertainty (please indicate)

_____50_____ m / ft / km / miles

Confidence Extent:

☐ **Y** - Confident full extent of feature **IS** known

☐ **N** - Confident full extent is **NOT** known

☒ **?** - **Uncertain** whether full extent is known

GENERAL DESCRIPTION OF COMMUNITY(See instructions for guidelines):

The forest is dominated by Black Ash, American Elm, and Ironwood. Sugar Maple and Yellow Birch were also common. Maiden hair fern and silver spleenwort are common. Wetter areas contained jewel weed and dwarf enchanters nightshade as well as other herbaceous species. Basswood was observed, though infrequent.

The community is on a generally north-facing slope with a low gradient of 0-10% slope. Loamy soils ranged from silty sandy loam to silty loam. The soils were rich and contained well developed structure in the more upland areas.

The community extended beyond the boundaries of our survey area, to the south and was therefore not mapped beyond that point

SAMPLE TYPE:	Additional sampling recommended?
__X__ Brief descriptive – **NOT SUFFICIENT FOR DOCUMENTING NEW EOs**	☐ Yes ☐ No
____ Generalized cover estimates & dbhs (p2)	Photos: ☐ Yes ☐ No
____ Nested plot samples (N = _____) (attach)	

II. VEGETATION BY STRATA

Community name & EO#:

TREE LAYER (canopy plus emergents, everything ≥ 10 cm dbh)

TOTAL COVER OF STRATUM:
<5% 10% 20% 30% 40% **50%** 60% 70% 80% 90+%

Total Basal Area: ft²/acre NC

Conifer %:0

Canopy height ____40___m or ft
Supercanopy spp? No

Species name/code	Cover class*	Dbh range ☐in ☒cm	Core ages	Species name/code	Cover class*	Dbh range ☐in ☐cm	Core ages	☐ check here if plot data are attached instead
Acer saccharum	19	10-60	NA					
Fraxinus nigra	19	10-50	NA					
Ulmus americana	9	10-25	NA					
Carpinus caroliniana	9	10-20						

SAPLING / TALL SHRUB LAYER (> 3 m tall and < 10 cm dbh)

TOTAL COVER OF STRATUM: <5% 10% 20% **30%** 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Ulmus americana	9			
Acer saccharum	19			
Carpinus caroliniana	19			
Tilia americana	1			

SHRUB LAYER (woody plants ~1 - 3 m tall)

TOTAL COVER OF STRATUM: <5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Acer saccharum	9			
Viburnum lantanoides	3			
Fraxinus nigra	9			

HERB / DWARF SHRUB LAYER (all herbaceous vascular plants plus any woody plants < 1 m tall)

TOTAL COVER OF STRATUM:
<5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE : tree regen_____%; shrub_____%;
graminoid____0____%; forb___75____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Adiantum pedatum	19			
Deparia acrostichoides	19			
Matteuccia struthiopteris	9			
Aralia nudicaulis	9			
Polystichum acrostichoides	3			

BRYOID LAYER (all ground-layer non-vascular plants; do not include epiphytes)

TOTAL COVER OF STRATUM:
<5% 10% 20% 30% 40% 50% 60% 70% 80% 90+%

DOMINANCE: bryophytes_____<5%____% lichens ____0____%

Species name/code	Cover class*	Species name/code	Cover class*	check here if plot data are attached instead ☐
Minimal and not keyed out	1			

*cover classes (**midpoint**): < 2%= **1**, 2-5%= **3**, 6-12%= **9**, 13-24%= **19**, 25-49%= **37**, 50-74%= **63**, 75-100%= **87**

ADDITIONAL SPECIES within area where vegetation cover by strata were taken

Stratum	Species code	Cover class	Stratum	Species code	Cover class

OTHER PLANT SPP seen in community (spp codes), for complete plant species list

Enchanters nightshade, maple, white ash, yellow birch, small component of balsam fir, knapweed, jewelweed and sedges (in wetter areas), jack in the pulpit, woodfern

III. ENVIRONMENTAL SETTING

Community name & EO#:

SOILS (rooting zone): Only brief inspection of soils conducted

Sample #____

Depth to which soil examined__2 in__

Organic layer depth_____cm or ☐ >1 m

Mineral layer below organic? _____depth_____

Mottling in top 30 cm?_____depth_____

Depth to water table:_____

Depth to obstruction:_____ nature of obstruction:_____

Stoniness: ☒ very little (<1%)/ ☐ moderate (2-25%)/ ☐ very (>25%)

pH:_____ measured in ☐ soil or ☐ interstitial water

vonPost decomposition (peat substrates only) _____ at _____ deep

AVERAGE TEXTURE:

- ☐ gravel
- ☐ sand
- ☒ loamy sand / sandy loam
- ☐ loam
- ☒ silt loam
- ☐ clay loams
- ☐ sandy clay / clay
- ☐ peat
- ☐ muck

DRAINAGE & MOISTURE REGIME (see MAPPSS key):

- ☐ very poorly drained
- ☐ poorly drained
- ☒ somewhat poorly drained
- ☒ moderately well drained
- ☐ well drained
- ☐ somewhat excessively drained
- ☐ excessively drained

ELEVATION: 1000

☐ m or ☒ ft?

ASPECT (TRUE):

North

SLOPE : Include units! (45º = 100%)

0%-5

☐ measured ☒ estimated

HYDROLOGIC REGIME:

- ☒ upland
- ☒ nontidal wetland:
  - ☐ perm flooded
  - ☐ semiper flooded
  - ☒ seasonally fld.
  - ☐ saturated
- ☐ tidal – irreg. fld.
- ☐ tidal – reg. fld.
  - ☐ saltwater
  - ☐ brackish
  - ☐ freshwater
- ☐ unknown

HABITAT PATCHINESS (describe zones or patches if present): Patches of wetter areas with jewelweed and enchanters nightshade; damp silty loam and evidence of surface flow channels throughout. Higher elevation areas had a more developed mineral soil with a sandy loam texture

MICROTOPOGRAPHY: some low hill with channel topography, where wetland and upland soils meet.

BEDROCK TYPE:

- ☐ Igneous
  - ☐ granite
  - ☐ dioritic
  - ☐ gabbroic
- ☐ Metamorphic
  - ☐ slate/phyllite
  - ☐ schist/gneiss
- ☐ Sedimentary
  - ☐ limestone
  - ☐ other

details?

TOPOGRAPHIC POSITION

- ☐ D drainage channel
- ☐ P low plain, level
- ☐ N narrow valley
- ☐ T toe of slope
- ☐ L lower slope
- ☒ M middle slope
- ☐ T hillside terrace
- ☐ U upper slope
- ☐ E cliff/ledge
- ☐ S ridge, summit, crest

SURFICIAL DEPOSIT:

- ☐ bedrock
- ☐ talus slope
- ☐ glacial till
- ☐ moraine
- ☐ esker/outwash
- ☐ glacial delta
- ☒ lacustrine/fluvial
- ☐ marine
- ☐ aeolian
- ☐ other:

THREATS TO COMMUNITY?

Logging potential, evidence of past logging

MANAGEMENT / PROTECTION NEEDS?

OTHER COMMENTS: The forest is relateively well delineated based on the distribution of the Northern maindenhair fern and silvery spleenwort. There is a mix of upland and wetland areas but an overall dominance of the enriched hardwood characteristics.

.

IV. SUMMARY AND RANKING

Community name & EO#: Hardwood river terrace forest /Upper floodplain hardwood forest

Applicable National Type:	NVC CODE: CEGL00_____	Comment re fit to type?

COMMUNITY RANKING

1. CURRENT CONDITION and quality of the community itself.

- Comment on the species composition and biological structure of the community (species diversity, indicator species, development/maturity, etc.) For forests: Do you consider this to be old growth? If so, based on what?

  Second- or third-growth forest, some larger trees, but dominated by mid-sized trees and saplings. Forest structure is developing nicely, though. Indicator species for this habitat type were common, animal use was evident, and invasive species were minimum

- Natural and anthropogenic disturbance **within** the community (check off, then describe extent and how recent below)

☒ Logging – most recently c. __>50__ yrs ago	☒ Animal effects (insect outbreaks, browsing)
☐ Agriculture / pasture	☐ Erosion
☐ Fire	☐ Dumping or Mining
☒ Wind or ice damage	☐ ORV / vehicle disturbance
☐ Impoundment	☐ Trails / roads
☐ Exotic plants	☐ Other, list:

List disturbance(s): to what degree have these altered natural ecological processes, and/or do they appear to effect the population?

Past logging likely had a large impact on the population, however it appears to be recovering nicely, browsing and insect damage appear to be within healthy ranges. Wind damage was evident though minor and much less than in adjacent habitats

Logging has occurred in the past, as evidenced by decaying stumps. Habitat is near roads

☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor).
☒ **B** – Some signs of human disturbance or degradation, but community generally intact.
☐ **C** – Signs of human disturbance or degradation, community compromised in some significant way.
☐ **D** – Highly disturbed (multiple impacts causing community to be drastically altered).

2. SIZE / QUALITY:

What is the approximate size of the community occurrence?_____3-5 _____ ☒ acres / ☐ hectares

☒ Covers the natural extent of this community type ☐ Has been truncated through adjacent land use

Size / Quality Rank: ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

3. LANDSCAPE CONTEXT of the area surrounding the community:

What land uses and/or natural communities surround the observed area? Describe the types and extent of anthropogenic disturbance **around** the observed area, and to what degree this may affect the observed community. To what degree can the observed community be protected from effects of adjacent land uses?

Area is near roads, powerline corridor and houses, however there is fairly contiguous forest, in different stages of development, nearby

☐ **A** – Community surrounded by >= 1000 acres of undisturbed landscape.
☒ **B** – Community surrounded by fairly intact landscape, though there may be cuts nearby.
☐ C – Community surrounded by fragmented forest or rural landscape.
☐ **D** – Surrounding area developed.

OVERALL RANK for Community ☐ **A** – Excellent ☒ **B** – Good ☐ **C** – Fair ☐ D – Poor ☐ **E** – Extant
based on your experience
Comments: Nice community with typical indicator species present; appears to be relatively small, although entire extent is not known c
limits of survey area. Within
hardwood matrix forest.

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

PART II (con't): VEGETATION DATA from PLOT SAMPLING (replacing spp lists on p. 2, in cases where plots are taken)

Community type:			EOnum:
LAYER	plot #		
TREE list species and dbh for all trees >= 10 cm dbh; *count standing dead as 1 species.* **note units:** QUAD SIZE: **note which size used** 5.64 m radius for 1/100th ha 7.98 m radius for 2/100th ha use same size throughout!			
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SAPLING cover class by species of: trees/shrubs > 3 m tall but < 10 cm dbh; PLOT SIZE: 2.8 m radius			
SHRUB cover class by species of woodies > 1 m tall but < 3 m tall; PLOT SIZE: 2.8 m radius			
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BRYOID ground-layer mosses, liverwort, lichens in herb quads. **resolution** (check one): __"moss"/"liverwort"/"lichen" only; __identified to major group ("peat mosses, broom mosses, feather mosses", etc.); __identified to genus; __identified to species.			
REMARKS:			

In box on p.3, list plant spp. present in the community but not in the sample plots so we have a complete species list.

* cover classes (record midpoint): < 2 **1** 2-5% **3** 6-12% **9** 13-24% **19** 25-49% **37** 50-74% **63** 75-100% **87**

Please send completed form to: Information Manager, Maine Natural Areas Program, State House Station #93, Augusta, ME 04330

APPENDIX E

Landscape Analysis Description and Field Survey Protocol for Small-Whorled Pogonia

New England Clean Energy Connect (NECEC) Project
Rare Plant and Exemplary Natural Community
Landscape Analysis and Field Survey Protocol

Introduction

Numerous plant species in Maine are considered rare, threatened, and endangered ("RTE"), and these are protected under both the federal Endangered Species Act of 1973 (16 U.S.C. §§ 1531 et seq.) and Maine's Natural Areas Program (MNAP) statute (12 M.R.S. §§ 544, 544-B & 544- C). Under the federal Endangered Species Act there are one endangered and two threatened plant species in Maine. These plants include the Furbish's lousewort (*Pedicularis furbishiae*), prairie white-fringed orchid (*Plantanthera leucophaea*), and small-whorled pogonia (*Isotria medeoloides*). The Official Species List, obtained through the ECOS-IPAC website, identified the small-whorled pogonia (federally threatened) and its possible presence within the boundaries of the NECEC project.

MNAP has also classified natural and distinguished vegetative communities across the state and has identified rare and unusual natural community types. According to MNAP, "A natural community is an assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of human intervention are minimal. A natural community includes all of the organisms (plant and animal) in a particular physical setting, as well as the physical setting itself" (Gawler and Cutko 2010).

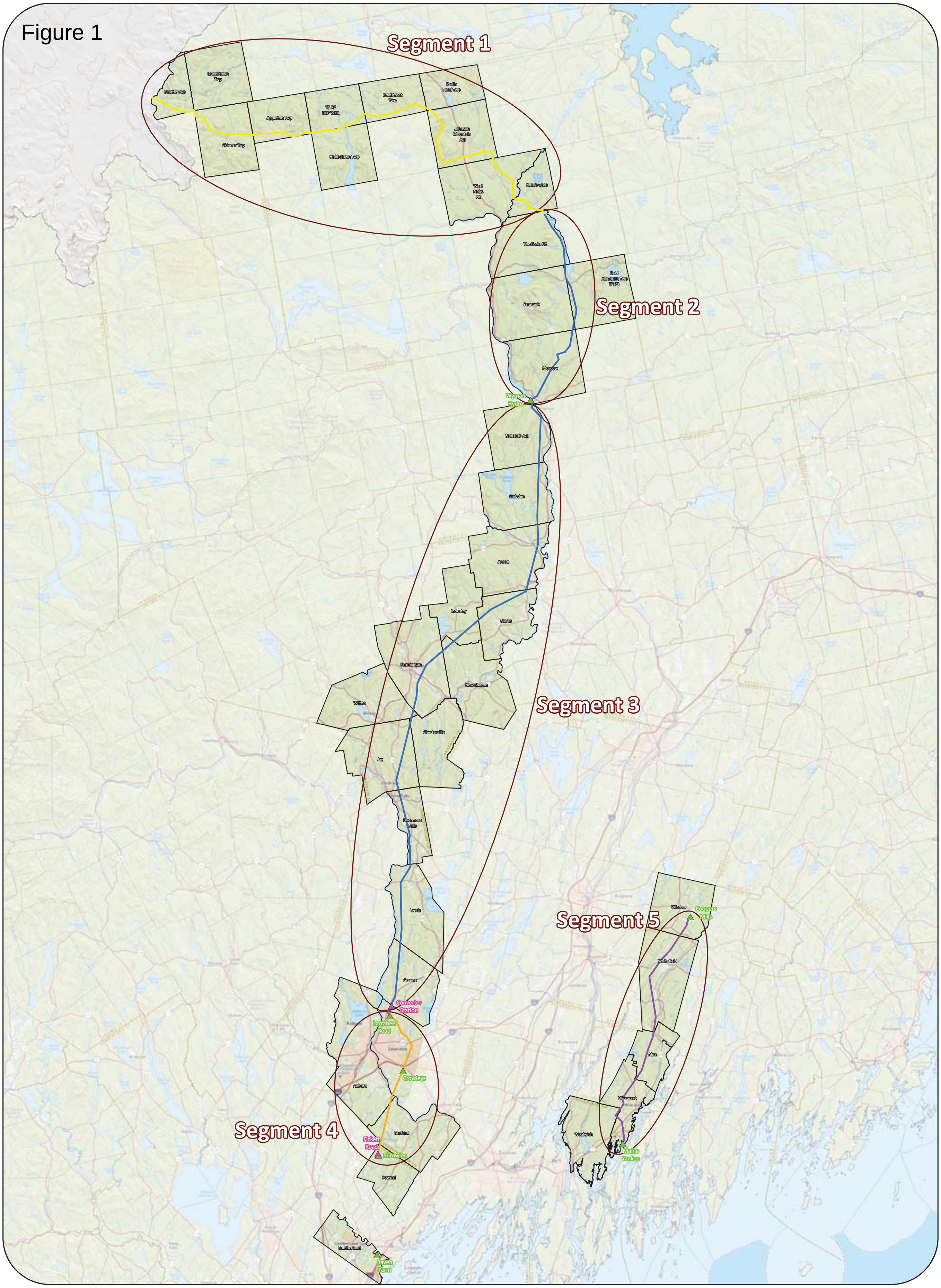
Central Maine Power Company (CMP), in developing its state and federal permit applications for the NECEC Project, submitted a letter to MNAP on May 10, 2017 requesting information on rare plants and exemplary natural communities in the Project area. MNAP provided the requested information and in its review of the Project strongly recommended landscape analysis and subsequent field surveys be conducted within previously un-surveyed portions of the Project Area, as well as resurvey of previously documented features in Segments 3, 4, and 5 (MNAP 2017).

Background

Segments 1 and 2 of the NECEC Project, located between the Canadian border in Beattie Township and Wyman Hydropower Station in Moscow (See Figure 1), are the portions of the project that have not previously been surveyed for rare plants and exemplary natural communities. Segments 3, 4, and 5 are within areas previously surveyed for rare plants during the permitting effort for CMP's Maine Power Reliability Program (MPRP). As part of MPRP, CMP consulted with MNAP to gather rare plant and natural community data and to develop a methodology to conduct rare plant surveys. As a result of those surveys, only a few locations in Segments 3, 4, and 5 were identified as having RTE plants and rare or exemplary natural communities.

On June 7, 2017, an interagency meeting was held with MNAP, United States Fish and Wildlife Service (USFWS), and the United States Department of Energy (USDOE) at the CMP office in Augusta to discuss landscape analysis and survey methods for rare plants and exemplary natural communities that would be implemented for the NECEC Project. At that meeting MNAP indicated that the northern portion of the Project, primarily Segments 1 and 2, is not an area with a high occurrence of documented rare plant species and stated that a desktop landscape analysis and field survey was necessary in those areas.

Figure 1



Legend

- HVDC (New ROW)
- HVDC (Existing ROW)
- New 345 kV Line
- Rebuild Sections
- Existing Substation
- Proposed Substation

New England Clean Energy Connect

Overview Map

10 Miles

CENTRAL MAINE POWER

8/15/2017

MNAP also determined that existing data on state-listed rare plants and exemplary natural communities within Segments 3, 4, and 5 was sufficient and recommended that CMP re-survey the known occurrences in those portions of the Project. MNAP and USFWS agreed that agency-provided habitat modeling should be used in conjunction with landscape analysis on Segment 3 between Jay and Lewiston for small whorled pogonia, due to annual variability of species presence in suitable habitats.

Methodology

Landscape Analysis

A landscape analysis will be performed on NECEC Segments 1, and 2, and Segment 3 (Jay to Lewiston portion only), using the following data sources:

1. USGS topographic maps
2. Color aerial photography
3. MNAP rare plant occurrence data
4. MNAP mapped rare or exemplary natural community locations
5. NECEC natural resource inventory data
6. Surface geology data
7. Soil survey data
8. Agency Natural Heritage habitat modeling for small whorled pogonia

Once all data is acquired it will be uploaded to ESRI's ArcGIS software to support the review and analysis of the project area for unique habitat features. Features that will be considered include:

1. Areas of high relief
    a. Steep slopes
        i. 16-30%
        ii. 31-45%
    b. Valleys and ravines
    c. Cliff faces and their bases
2. Areas within a defined distance of known occurrences containing similar habitat
    a. 1,000-foot distance from all known occurrences
    b. Selectively greater distances in areas adjacent to exemplary natural communities
3. Wetland systems
    a. Large wetland systems
    b. Major rivers and streams (and associated landforms)
4. Bedrock exposure
    a. Talus
    b. Serpentine bedrock
    c. Limestone bedrock
    d. Ledge outcrops
5. Unique soils
    a. Sandplains and areas with sandy soils
    b. "Rich soils", including peaty and loamy soils
6. Natural communities and landforms
    a. Mid-successional, mixed wood, mesic forest (small whorled pogonia)
    b. Maple basswood ash forests
    c. Red pine woodland
    d. Spruce pine woodland

e. Open cedar fen
f. Silver maple floodplain forest
g. Saddles
h. Cold-air talus slopes

Areas identified as containing potential habitat for RTE plants, or rare natural communities, will be delineated in ArcGIS and a shapefile (or similar format) of the proposed survey locations will be provided to MNAP and USFWS for review and comment. The implementation of field surveys on Segments 1 and 2 and the portion of Segment 3 to be surveyed for small whorled pogonia will be initiated after receiving agency review and approval of the proposed survey locations.

Resurvey of known occurrences on NECEC Segments 3, 4, and 5 will be begin as early as June or when conditions are determined to be favorable.

Field Survey

The purpose of the field effort will be to survey unique habitat features for the possible presence of RTE plant species and rare or exemplary natural communities. All locations identified as containing potentially unique habitat through landscape analysis, as well as any unique habitat features identified in the field, will be surveyed. Surveyors will search for any RTE plant species protected under federal and/or Maine law, as well as rare or exemplary natural communities, but will primarily focus on those known to occur in each region or vicinity. Surveyors will have sufficient experience in plant identification to be able to correctly identify RTE species. The qualifications of field survey personnel will be provided to MNAP and USFWS.

Field survey crews will be provided with a set of maps depicting the final survey locations identified through occurrence data, the landscape analysis, and agency input. The survey locations will also be loaded into global positioning system (GPS) software for use in the field.

Field surveys will be generally conducted, between June 1 and October 1. Surveys will begin in the northern portions of the project (Segments 1 and 2) in mid-June to allow for additional leaf-out time to assist with proper plant identification. Surveys will consist of "meandering searches", which involve walking a stretch of ROW (proposed or existing) twice: once along each side of the ROW, in a zig-zag pattern to ensure adequate coverage of the ROW. Generally, the distance of each meandering zig-zag will vary depending on terrain and vegetation and will visually cover approximately 30 to 50 meters. Habitat features known to support rare species and locations adjacent to unique natural communities will be thoroughly searched. If habitat conditions are observed to be favorable for the presence of RTE plants, the surveyor(s) will proceed at a reduced pace and narrow their search.

Large sections of proposed ROW that are not identified as having suitable habitat during the landscape analysis will be randomly sampled. As recommended by MNAP, random samples will include 10% of the ROW (equivalent to ¼ mile per 3 miles of ROW) in locations where no unique habitat features were identified during the landscape analysis. CMP will re-evaluate the random sampling protocol following agency review of the results of the landscape analysis and will adjust the frequency of sampling as needed.

Rare plant populations will be mapped to sub-meter accuracy, and locations will be noted and documented in a shapefile that will be provided to MNAP and USFWS (for small whorled pogonia, if found) upon completion of the field survey. In the event a large population of rare species is identified it will be mapped by creating a polygon around the entire population, with the understanding that the

density of the population may vary throughout. Small or single-stem populations will be mapped as point data with a radius of 3 meters.

Small whorled pogonia surveys will be conducted using the protocols identified in the MNAP fact sheet: *Small Whorled Pogonia Survey Protocols for Maine* (See Attachment A). Any small whorled pogonia identified during the field survey will be recorded on MNAP survey forms and the documentation will be provided to both MNAP and the USFWS.

Documentation of all rare plants and exemplary natural communities will be performed on survey forms provided by MNAP, and per their associated instructions (See Attachment B). These forms include basic information for the identified feature, including population size, geographic area, the species or community's current condition (e.g., flowering, vegetative), and evidence of disturbance. Additional information includes, but is not limited to, the name of the observer, date of survey, and general location (e.g., segment, town). All forms will be submitted to MNAP upon completion of the field survey.

A final report documenting the results of the field survey effort will be provided for agency review following the conclusion of the survey.

REFERENCES

Gawler, S. and A. Cutko. 2010. Natural landscapes of Maine: A Guide to Natural Communities and Ecosystems. Maine Natural Areas Program, Maine Department of Conservation. Augusta, Maine. 347 pp.

MNAP 2017. Memorandum to Maine Department of Environmental Protection – Rare and Exemplary Botanical Features, NECEC Transmission Line and Substation.

Attachment A
Small Whorled Pogonia Survey Protocols for Maine

Small Whorled Pogonia (*Isotria medeoloides*) Survey Protocols for Maine

Introduction: Small whorled pogonia is a rare native orchid of eastern N.A. that is listed as Threatened under the federal Endangered Species Act, and as Endangered by the state of Maine. For additional guidance on conducting surveys, on the biology of the species, or for field assistance for completing a survey contact the Maine Natural Areas Program (Don Cameron, Don.S.Cameron@maine.gov; 207 287-8041).

Species Description: Small whorled pogonia plants appear in the late spring (late May to early June) from a perennial underground rootstock. Stems usually grow singly, though sometimes in pairs, and are 3-6" (8-15 cm) tall. Under normal conditions plants produce a single whorl of 5 elliptical leaves 1-3" (2.5-8 cm) long at the top of the stem. Occasionally, a single small leaf will also grow under the whorl along the stem. Note that the plants are often the target of small herbivores and may lose one or more of their leaves. The stem itself is moderately stout, about 1/8' (2-3 mm) wide, and glaucous pale green. Half or more of the plants in any given population will grow vegetatively in any given year, bearing no flowers or fruit. On reproductive plants, 1 to 2 flowers appear soon after emergence. They are greenish yellow, about 1' (2.5 cm) long, and born on top of the whorl of leaves. Pollinated flowers will produce an upright, cylindrical fruit (a capsule) about 1" (2.5 cm) long by ¼" wide (0.6 cm), which turns from pale green to light brown by the fall when it splits open to release thousands of dust-like seeds. Review the species pictures included on the last page, and search on line for additional images capturing the variety of plant conditions.

Look-a-Likes: Other common whorled-leaved herbs that grow in small whorled pogonia habitat in Maine include starflower (*Lysimachia borealis*, a.k.a. *Trientalis borealis*), bunchberry (*Chamaepericlymenum canadense*, a.k.a. *Cornus canadensis*), and Indian cucumber-root (*Medeola virginiana*). Of these three species, vegetative Indian cucumber-root plants are most similar to small whorled pogonia, but can be readily distinguished from it by their narrow, darkened, pubescent stems. Anyone unfamiliar with small whorled pogonia should brush up on the identification of these three look-a-likes as needed.

Population and Habitat Characteristics: Plants within a population are usually thinly scattered and widely spaced though occasionally several will occur in local group. In Maine, small whorled pogonia typically occurs in mid-successional, mixed wood, mesic forests with a sparse shrub layer and thick leaf litter. Herb cover may vary ranging from high cover of ferns and other herbs to very little cover. The plants often occur near intermittent streamlets or where a hardpan impedes water percolation into the soil. Some common associated understory plants include Indian cucumber-root (*Medeola virginiana*), New York fern (*Thelypteris novaboracensis*), cinnamon fern (*Osmunda cinnamomea*), partridgeberry (*Mitchella repens*), and rattlesnake plantain (*Goodyera pubescens*).

Survey Guidance: Due to the inconspicuous nature of the plants, relatively small sizes of populations, and the thin distribution of plants within supporting habitat, small whorled pogonia populations can be difficult to detect. A survey of a given area should be methodical, and completed with concentration and focus. Ideally surveys for this species should be conducted by botanically trained individuals who have previously seen the species and its preferred habitat.

Time of Year: Surveys should be conducted between June 8 and September 31, the period of the growing season when plants are emerged and have leaves. Plants may sometimes be found with leaves and capsules as late as early October, at which time leaves will turning yellow and will otherwise show signs of wear. Plants may be sometimes found outside of this calendar window but negative surveys outside of the calendar window cannot be considered conclusive.

Recommended Survey Methods: Start by assessing the habitat types at the site. Identify areas with conditions that may support the species. The species only grows under a forest canopy. The canopy may be closed or have gaps. The species does not grow in habitats that lack a forest canopy (open fields, shrub dominated areas, early successional cover) nor does it grow in wetlands, though it does sometimes grow in low-lying areas near the edges of wetlands or along small streams. Once potential habitat areas are identified they should be surveyed methodically by dividing them up into visual units. Visual units can be delimited by local topography (ravines, slopes, benches), or by landmarks (boulders, downed or otherwise conspicuous trees, old woods roads, stone walls), and or by hanging survey ribbon or placing wire flags. The surveyor should slowly walk back and forth progressing through a given visual unit. A stick or pole is helpful for nudging ferns clumps or low hemlock branches aside. Squatting and peering under tall ferns is also a good way to spot plants. As small whorled pogonia plants are relatively small and blend in well, it is very important to keep attention focused in the area immediately around yourself (0-10' radius). In areas with very thin ground cover such as what occurs under mature hemlocks, it is possible to spot plants as much as 25' feet away, but most plants are found within 10' of an observer. Maintaining a track with a GPS unit is very useful for documenting survey effort and identifying survey gaps.

Small whorled pogonia plants may grow anywhere within a site where a population is located but it favors certain micro-habitats such as:

- vernal or ephemeral runoff courses (leaf piles)
- terraces or benches and base-of-slope areas.
- small canopy openings, fern patches

Documenting a Population: If one or more small whorled pogonia plants are found, tie brightly colored surveyor ribbon adjacent to each plant and collect GPS coordinates at the respective locations. Take close up digital images of the plants to be used for subsequent confirmation of the species by the Maine Natural Areas Program. Once plants have been found, spend additional time searching the areas within a 20' radius of each plant, as there is a comparatively high probability of finding additional plants within this area.

If plants are found, minimize impacts by limiting foot traffic and any other potential disturbances in and around areas where they are growing. Avoid touching plants with fingers as handling can attract herbivores.

Upon completion of the survey, make sure there is an easy and obvious way to relocate any plants that were found.

If plants are found, please contact the Maine Natural Areas Program for recommendations regarding any proposed land uses (287-8044/maine.nap@maine.gov).

Small whorled pogonia (*Isotria medeoloides*):

Ideal flowering specimen (early June)

Late season, vegetative plants

Hidden in ferns, a not uncommon location

Plants with capsules

Attachment B
MNAP Rare Plant Survey Form and Instructions

Project (MNAP assigns) _____

SPECIAL PLANT SURVEY FORM

Site: _____ Survey Site: _____

Quad name: _____ Quad code: _____

County: _____ Town: _____

Plant Name: ☐ New ☐ Update Occurrence #:

Date:	Surveyor(s):	Sourcecode (MNAP assigns):
Primary Surveyor Address:	Phone:	Email:

GPS Datum ☐WGS 84 ☒NAD 83 ☐ NAD 27 ☐ Other
GPS Coordinates ☐ UTM Zone 19N ☐ Decimal Degrees (dd.dddd) ☐ Deg Min Sec (dd mm ss) ☐ GPS (dd mm.mm) ☐ Other
North West Additional Coordinates

Directions to Occurrence:
☐ Strongly recommend use of air photos and USGS topographic maps for relocation of the site on the ground.

MAP: Please attach a map, preferably 1:24,000 scale topo map, showing the location of the observation.

Locational Uncertainty (how closely can you map the feature to its actual location?)

☐ mapped to w/in 12.5 m of actual location; ☐ greater uncertainty (estimate = ☐m / ☐ft / ☐km / ☐miles); ☐ aerial delimited

Confidence in Observation of Population Extent

☐ Confident full extent of feature **IS** known; ☐ Confident full extent is **NOT** known; ☐ **Uncertain** whether full extent is known

EO DATA	Phenology	Population Area	Vigor? ☐ Normal ☐ Other than normal Explain:
# of Plants ☐ Individuals ☐ Ramets Population Structure % Vegetative % Reproductive	☐ In leaf ☐ In bud ☐ In flower ☐ Immature fruit ☐ Mature fruit ☐ Seed dispersing ☐ Dormant	☐ 1 square yard ☐ 1 – 5 square yards ☐ 5 – 20 square yards ☐ 20 – 100 square yards ☐ 100 sq yds to 1 acre ☐ 1 acre + ~area **actual** habitat ~ area **potential** habitat	Evidence disease, predation, etc? Explain: ☐ Yes ☐ No Type of reproduction? Explain: ☐ Sexual ☐ Asexual ☐ Not Observed

Other Comments:

GENERAL DESCRIPTION

Associated natural community:

Associated plant species:

Substrate/soil type:

Threats to Population:

Conservation/Management/Research needs:

Elevation	**Aspect**	**% Slope**	**Light**	**Topographic Position**	**Moisture**
Min ft / m Max ft / m	☐ N ☐ NE ☐ E ☐ NW ☐ S ☐ SE ☐ W ☐ SW ☐ Flat or NA	☐ Flat ☐ 0-10 ☐ 10-35 ☐ 35+ ☐ Vertical	☐ Open ☐ Partial ☐ Filtered ☐ Shade	☐ Crest ☐ Upper Slope ☐ Mid-slope ☐ Lower Slope ☐ Bottom ☐ Level Plain	☐ Inundated ☐ Saturated (wet mesic) ☐ Moist (mesic) ☐ Dry-mesic ☐ Dry (xeric)

Project (MNAP assigns) _____

Photograph taken? ☐ No ☐ Yes	Specimen collected? ☐ No ☐ Yes Collection # Repository	Do other members of this genus occur at this site? ☐ No ☐ Yes If yes, are there hybridization issues? ☐ No; ☐ Yes; Explain Are there identification issues? ☐ No; ☐ Yes; Explain

Landowner name/address for entire population (attach additional owner information on a separate sheet):	Phone	Is landowner aware of plant? ☐ Yes ☐ No
	Tax map # (if known)	Is landowner protecting plant? ☐ Yes ☐ No
	Lot # (if known)	Comments

EO RANKING

CURRENT CONDITION of the plant's immediate habitat. Is the habitat pristine or degraded? Note any disturbances within the plant habitat (check off, describe below to what degree these have altered natural ecological processes, or if they have any negative or positive effects on the population). Note how the disturbance(s) may influence success of the plant at the site.

☐ Logging-most recently ~ yrs ago
☐ Agriculture / Pasture
☐ Animal effects (insect outbreaks, browsing)
☐ Wind or ice damage
☐ Fire
☐ Impoundment
☐ Exotic plants
☐ Erosion
☐ Dumping or mining
☐ ORV / Vehicle disturbance
☐ Trails / Roads
☐ Other
☐ No Evidence of disturbance

Describe:

Condition Rank
☐ **A** – No apparent signs of human disturbance (or long enough ago that effects are no longer visible or are extremely minor)
☐ **B** – Some signs of human disturbance or degradation, but habitat generally intact
☐ **C** – Signs of human disturbance or degradation, and habitat compromised in some significant way
☐ **D** – Highly disturbed (multiple impacts causing habitat to be drastically altered)
☐ **Other** / Habitat disturbed, consistent with needs of species / **Explain**:

SIZE / QUALITY: How large is this population relative to typical populations of this species?
Does it appear to be capable of maintaining itself if its habitat remains basically intact? ☐ Yes ☐ No

Size / Quality Rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor

Comments:

LANDSCAPE CONTEXT of the area surrounding the plant habitat. What land uses and/or natural communities surround the observed area? Is the habitat fragmented? To what degree can the population be protected from effects of adjacent land uses?

Comments:

Landscape Rank
☐ **A** – Population surrounded by > = 1000 acres of undisturbed landscape
☐ **B** – Population surrounded by fairly intact landscape, though there may be cuts nearby
☐ **C** – Population surrounded by fragmented forest or rural landscape
☐ **D** – Surrounding area developed
☐ **Other** / Explain:

OVERALL RANK for EO based on your experience ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Comments:

MNAP reviewed / verified rank ☐ **A** – Excellent ☐ **B** – Good ☐ **C** – Fair ☐ **D** – Poor ☐ **E** – Extant

Date: Reviewer: Rationale:

Special Plant Survey Form Instructions

Areas shaded gray are to be filled in by Maine Natural Areas Program (Sourcecode and MNAP reviewed/verified rank).

At a minimum, we need the following: A map showing where you were/where the plant was observed, your name, the date of the survey, the plant name, and the number of plants/relative size of the population. However, additional data fields on the form are extremely helpful, so please try to fill them in.

Site and Survey site: Some areas within the state have been visited repeatedly, and these typically have a site name. Some larger areas also have smaller survey site names. For instance, 'Mt. Katahdin' is a site name, but 'Chimney Pond' is a survey site name. If you don't know the name of the site, leave it blank. You can assign a survey site name, but do this based on some feature/place name, preferably one visible on a USGS topographical map.

Quad name and Quad code: The name of the USGS quad (1:24,000 scale) where the plant is located. If you don't know the quad code, leave it blank.

County and Town: The name of the county and town where the plant is located.

Date: Date of survey/observation.

Surveyor(s): Please list principal surveyor first.

Sourcecode: Please leave this section blank.

Plant name: Scientific name is preferred.

GPS Coordinates: If you have a GPS unit, please use it! Record the location of the plant. Remember, NAD 83 is most helpful, and we are in UTM Zone 19N. If you use another datum, please indicate what it is (e.g., NAD 27). Also, please record the accuracy of your unit.

Directions to Occurrence: Directions to the site can be in general terms, but please be specific about directions to the plant location. We would like enough detail that a person could use these directions to relocate the plant.

Feature Map: A 1:24,000 scale USGS map is most helpful, though you can zoom in to the area to show the location of the plant. However, if you do zoom in, be sure that enough locational information is on the map that a person can relate your map to the larger quad. Indicate on the map the exact location of the observation(s).

- If your observation is a small patch or a small number of individuals, place a SMALL DOT on the map, with an arrow pointing to it or a large circle around it so it can be easily seen.

- If you are mapping a larger plant population,

    a) Draw a thin solid boundary line showing the extent of the observed area occupied by the population.

    b) Indicate disjunct patches (polygons) by drawing the boundary for each patch separately.

    c) If the boundary follows the edge of a lake, stream, road, marsh, or other feature, draw the boundary precisely on the edge of the feature.

    d) Where needed, add notes to the map with instructions on where the boundary line is located or if the boundary is shared with other observations.

Locational Uncertainty: This refers to any uncertainty you may have as to where the actual observation occurred. Are you certain that you are within 12.5 meters (~40 feet) of where the plant actually grows? If not, please estimate your uncertainty distance based on landmarks, elevation, etc. If you mapped a population based on air photos, you may choose areal delimited.

Confidence Extent: Are you confident that the full extent of occupied habitat or area of the plant is known or has been surveyed?

- Yes = you know that the full extent of the population IS known.
- N = you know that the full extent is NOT known. This would be for instances where you know that there is more of the plant population out there, but you didn't get to see it all.
- ? = you are uncertain if the full extent is known. This would be for instances where you did a cursory look around the population for more, but you aren't certain you examined all of the available or suitable habitat.

EO Data: Most important is the number of plants and any other comments. Note if the population size is a precise count or an estimate. Please fill out other fields if you can. Comments can include things such as how much area was searched for the plants; how much of the searched area the plants covered; are stems scattered or clumped, or do they have some other distribution pattern; a brief word picture of the population; and any variations in size, health, or distribution of the population not well covered by checkoff items.

General Description: This is for the plant habitat. Name the associated natural community if you can. List some of the associated plants and the substrate type. Note elevation, aspect, PERCENT slope, light, topographic position, and moisture if you can.

Threats to Population: Indicate these if you can, note if there are none.

Conservation/Management/Research Needs: Do you see any needs for this plant population?

Did you take a photograph? For difficult species, please attach a copy. Did you collect a specimen? If yes, please give collection number (if there is one) and repository (even if it is your personal collection). Note if other members of the genus occur at this site, if there are hybridization issues, if there are identification issues.

Landowner information: Please include this if you can. If there are multiple landowners, list them all if you can. If you know tax map and lot numbers, please provide these. Do you know if the landowner is aware of the plant? Is the landowner protecting the plant?

EO RANKING

Current Condition: This section refers to the condition of the area within the plant habitat. We are looking for a "plant's eye view". Check off any disturbances observed, and describe how these may influence the success of the plant at the site (i.e., does the disturbance have a positive or negative effect?).

Condition is an integrated measure of the quality of biotic and abiotic factors, structures, and processes within the observed area, and the degree to which they may affect the continued existence of the plant at this location.

Components of condition for species are:
1) reproduction and health,
2) species composition and biological structure,
3) ecological processes, and
4) abiotic physical/chemical factors.

Factors to consider include evidence of regular successful reproduction, richness/distribution of species, presence of exotic/invasive species, degree of disturbance, changes to ecological processes, stability of substrate, and water quality.

Size/Quality: This is a quantitative measure of the area and/or abundance of the plant at this location.
Components of size are:
1) area of occupancy,
2) population abundance,
3) population density, and

4) population fluctuation.

Landscape Context: This section refers to the condition of the area surrounding the plant habitat. Is the area an undisturbed, functioning natural ecosystem? What are the current and past land uses? Is the habitat fragmented?

Landscape context is an integrated measure of the quality of biotic and abiotic factors, structures, and processes surrounding the observed area, and the degree to which they may affect the continued existence of the plant at that location.

Components of landscape context for species are:
1) landscape structure and extent,
2) condition of the surrounding landscape (i.e., community development/maturity, species composition and biological structure, ecological processes, and abiotic physical/chemical factors).

Factors to consider include connectivity, fragmentation/patchiness, stability/old growth of communities, richness/distribution of species, presence of exotic/invasive species, degree of disturbance, changes to ecological processes, stability of substrate, and water quality.

Overall Rank: This is the "score card" for the population relative to other populations in Maine of the same species. A=highest quality, D=probably not viable. Note that E is not worse than D, it denotes that the species is Extant.

Comments could include why you assigned a particular rank (e.g., largest population in the state; small population, excellent habitat; large population, fragmented habitat under development pressures), and also your experience with this species (how many populations have you seen? What geographic area have you observed this species in?).

MNAP reviewed/verified rank: Please leave this section blank. A botanist or ecologist at MNAP will review and verify the rank.

APPENDIX F

Summary Survey Results Table

GIS CODE	Date	Lead Surveyor Name	Quad Code Numeric	Quad Names	Town	Latitude	Longitude	Plant Name	Number of Individutals	Phenology (in leaf, bud, flower, fruit, etc.)	Associated Natural Community/Habitat	Associated Plant Species	Comments
NA	7/27/2018	Art Gilman				NA	NA	*Allium tricoccum*	NONE	NA			No plants found during revisit.
CASI01AR CASI02AR	7/3/2018	Art Gilman	44070A2	Lewiston	Lewiston	44.023698	-70.175755	*Carex siccata*	100 3000	in leaf, fruit	River bank terrace/Powerline corridor	Rubus flagellaris, Elymus repens	Two distinct areas of same population.
DRGO01AR	7/12/2018	Art Gilman	45069A7	Mahoney Hill	Moscow	45.117098	-69.861951	*Dryopteris goldiana*		in leaf, fruit	Hardwood Seepage Forest	Impatiens capensis, sedges, Betula alleghaniensis	Small area near open ROW, seepage area follows what appears to be an old logging road.
EA03AR	7/26/2018	Mao Lin	45069C8	The Forks	Moxie Gore	45.356975	-69.894886	Enriched Northern Hardwood Forest	NA	NA	Maple - Basswood - Ash Forest	Adiantum pedatum, Deparia acrostichoides, Fraxinus nigra, Carpinus caroliniana, Ulmus americana, Athyrium angustum, Impatiens capensis	Rich forest spanning drier areas of wetland, with loamy soils ranging from silty to sandy. Slight northern aspect, abundant maidenhair fern and only occasional basswood.
NA	7/27/2018	Art Gilman				NA	NA	*Fimbristylis autumnalis*	NONE	NA			No plants found during revisit.
GALKAM001DMC	7/11/2018	Duane Choquette	45070D4	Tumbledown Mountain	Appleton Township	45.466260	-70.468178	*Galium kamtschaticum*	506	leaf, bud, flower, immature fruit, mature fruit	Northern Hardwood Forest	Acer saccharum, Betula alleghaniensis, Acer pensylvanicum, Glyceria striata, Impatiens capensis, Thalictrum polygamin, Oxalis montana, Galium palustre, Circaea alpina, Sambucus racemosa	Large population along the edge of an old logging road and active moose trail. The surrounding land is all utilized for logging and is currently in a regenerative state from the last logging cycle.
GALKAM002DMC	7/11/2018	Duane Choquette	45070D4	Tumbledown Mountain	Appleton Township	45.466046	-70.469440	*Galium kamtschaticum*	16	leaf, flower, mature fruit	Northern Hardwood Forest	Acer saccharum, Betula alleghaniensis, Acer pensylvanicum, Glyceria striata, Impatiens capensis, Galium palustre, Circaea alpina, Sambucus racemosa, Corlus cornuta, Nabalus altissimus, Carex utriculata, Osmunda claytonia, Trillium undulatum	Small population. Site is a junction of two old logging roads, with a hillside seep upslope.
GALKAM003DMC	7/11/2018	Duane Choquette	45070D4	Tumbledown Mountain	Appleton Township	45.465980	-70.469568	*Galium kamtschaticum*	85	leaf, flower, mature fruit	Northern Hardwood Forest	Acer saccharum, Betula alleghaniensis, Acer pensylvanicum, Glyceria striata, Impatiens capensis, Carex utriculata, Osmunda claytonia, Carex gynandra	Small population. The surrounding land is all utilized for logging and is currently in a regenerative state from the last logging cycle. A recent clearcut is located <100 feet to the west of the sample site.
GERU01AR GERU02AR GERU03AR	7/6/2018	Art Gilman	45069A8	Bingham	Concord Twp	45.023784	-69.883264	*Gentiana rubricaulis*	29 120 4 1	in leaf	Mixed Graminoid - Shrub Marsh	Typha latifolia, Packera shweinitziana, Geum aleppicum, Thelypteris palustris, Platanthera psycodes	Four distinct areas of same population. Plants were growing along edge of cattail areas and up into the upland semi-forested areas along the edge of the ROW.
GERU04AR	7/11/2018	Art Gilman	45069A8	Pleasant Ridge Pit	Moscow	45.094096	-69.878232	*Gentiana rubricaulis*	300 300	in leaf	Mixed Graminoid - Shrub Marsh	Carex flava, Typha latifolia, Salix discolor	Two distinct areas of same population. Northern area goes about 30 ft into cedar swamp forested area west of the cleared ROW.
EA01AR	7/7/2018	Art Gilman	44070D2	Livermore Falls	Livermore Falls	44.403416	-70.148538	Hardwood River Terrace Forest	NA	NA	Upper Floodplain Hardwood Forest	Querus rubra, Betula alleghaniensis, Acer rubrum, Onoclea sensibilis, Athyrium angustum, Matteuccia struthiopteris, Osmunda claytoniana (interrupted fern)	Previously characterized as Maple-Basswood-Ash. Located on a river floodplain terrace. Presence of at least one butternut tree and trees are of large size with good forest structure and few invasives.

GIS CODE	Date	Lead Surveyor Name	Quad Code Numeric	Quad Names	Town	Latitude	Longitude	Plant Name	Number of Individutals	Phenology (in leaf, bud, flower, fruit, etc.)	Associated Natural Community/Habitat	Associated Plant Species	Comments
EA02AR	7/27/2018	Art Gilman	44069G8	Madison West	Anson	44.853352	-69.886138	Hardwood River Terrace Forest	NA	NA	River Terrace Hardwood/Upper Floodplain Hardwood Forest	Quercus rubra, Fraxinus pennsylvanica, Ulmus americana, Lonicera morrowii, Onoclea sensibilis, Athyrium angustum, Matteuccia struthiopteris	On an upper terrace associated with Carrabasset Stream not for above its confluence with the Kennebec River (and likely back-flooded from the river at extremes). The community is dominated by green ash and red oak with minor component of elm. The age structure is young except for a few large red oak and green ash. The forest is rather heavily invaded by invasive honeysuckles (about 40%-50% cover overall, which is substantially more than observed in 2007). Understory herbs are typical, but lack elements of richness such as blue cohosh, wild leek, etc.
HOLO01AR	7/6/2018	Art Gilman	45069A8	Bingham	Moscow	45.067711	-69.898568	*Houstonia longifolia*	500	in leaf, bud, flower	Powerline ROW/Shallow marsh - sloping edge	Danthonia spicata, Centaurea stoebe, Juniperus communis, Drymocallis arguta, Lechea intermedia	Located on high river terrace, within the cleared powerline corridor on bare gravel soil; where lichens and juniper encroach, the plants are much less robust.
ISME01AR	7/5/2018	Art Gilman	44070B2	Lake Auburn East	Greene	44.221891	-70.168584	*Isotria medeoloides*	1	in leaf	Oak - Pine Forest	Tsuga Canadensis, Quercus rubra, Acer rubrum, Betula alleghaniensis	No herbs in immediate vicinity. Plant was growing on steep embankment leading to a small seasonal stream. Closed forest canopy, with thick litter layer and very little understory or groundcover.
JackPineWood004DMC	7/18/2018	Duane Choquette	45070D3	Spencer Lake	Bradstreet Township T4 R7	45.495680	-70.254000	Jack Pine Forest	NA	NA	Jack Pine Forest	Pinus banksiana, Pinus strobus, Picea rubens, Pinus resinosa, Huperzia lucidula, Vaccinium angustifolium, Pteridium aquilinum, Gaultheria procumbens, Cornus canadensis, Pleurozium schreberi	Jack pine forest northwest of Egg pond. The stand is bordered by three large logging cuts, to the north east, and west. The Jack pine Forest extends south outside of the study corridor. An examination of aerial photography and field reconnaissance shows the jack pine forest ending in a spruce bog community.
JackPineWood005DMC	7/18/2018	Duane Choquette	45070D3	Spencer Lake	Bradstreet Township T4 R7	45.496380	-70.257820	Jack Pine Forest	NA	NA	Jack Pine Forest	Pinus banksiana, Pinus strobus, Picea rubens, Pinus resinosa, Huperzia lucidula, Vaccinium angustifolium, Pteridium aquilinum, Gaultheria procumbens, Cornus canadensis, Pleurozium schreberi	Predominately Jack pine (90%), with mixed red pine and red spruce in the canopy. The understory is dry and open, with lowbush blueberries, laurels, and snowberries found sporadically in patches, with bracken fern present in areas where the canopy thins. The Jack Pine woodland abuts regenerating clear-cuts to both the east and west, which are dominated by young red spruce, though scattered young jack pines can be found throughout.

GIS CODE	Date	Lead Surveyor Name	Quad Code Numeric	Quad Names	Town	Latitude	Longitude	Plant Name	Number of Individutals	Phenology (in leaf, bud, flower, fruit, etc.)	Associated Natural Community/Habitat	Associated Plant Species	Comments
JackPineWood006DMC	7/18/2018	Duane Choquette	45070D2	Enchanted Pond	Bradstreet Township T4 R7	45.495550	-70.226780	Jack Pine Forest	NA	NA	Jack Pine Forest	Pinus banksiana, Picea rubens, Pinus strobus, Abies balsamea, Kalmia angustifolia, Vaccinium angustifolium, Pteridium aquilinum, Gaultheria procumbens, Cornus canadensis, Pleurozium schreberi, Huperzia lucidula	Predominately Jack pine (70%), with mixed red pine, red spruce, and balsam fir in the canopy. The understory is dry and open, with bracken fern and bunchberry found throughout. The Jack Pine Forest is fairly extensive, extending outside of the survey area to the north and south. The Forest also spans a large alder-dominant stream valley and two smaller wetland seeps. The Jack Pine gives way to a spruce and fir dominant forest to the south. Sugar maples saplings appear sporadically in the understory in the western edge of the Jack Pine Forest.
LINDU01AG	7/28/2018	Art Gilman	4407000	Wilton	Jay	44.54054	-70.163594	Lindernia dubia var. anagallidea	15-20	in leaf, mature fruit, seed dispersing	general forest/powerline/gravel pit	Juncus tenuis, Agalilnis tenuifolia	Very limited availabel habitat (mud-puddle damp, vs. dry sand surrounding).
TRCL01AR	7/12/2018	Art Gilman	45069A7	Mahoney Hill	Moscow	45.101345	-69.872975	*Trichophorum clintonii*	25	in leaf, bud, fruit	Powerline ROW	Pteridium aquilinum, Chamaepericlymenum canadense	Upslope from very actively eroding stream, on dry-gravely soils under bracken fern and in access road.

NA = Not Applicable

EXHIBIT I: CULVERT REPLACEMENT PROGRAM

New England Clean Energy Connect (NECEC) Project
Culvert Replacement Program
(*Revised June 2020*)

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.

All projects completed under the Culvert Replacement Program must have no effect on endangered Atlantic salmon and their critical habitat.

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, but only in the vicinity of Segments 1 and 2. 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 $1,875,000, sufficient to replace approximately 20-35 culverts on lands outside of CMP's ownership, specifically in the vicinity of Segments 1 and 2. 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.

EXHIBIT J: NLEB VERIFICATION LETTER

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: May 29, 2020
Consultation Code: 05E1ME00-2017-TA-0579
Event Code: 05E1ME00-2020-E-03942
Project Name: New England Clean Energy Connect

Subject: Verification letter for the 'New England Clean Energy Connect' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Lauren Johnston:

The U.S. Fish and Wildlife Service (Service) received on May 29, 2020 your effects determination for the 'New England Clean Energy Connect' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Atlantic Salmon, *Salmo salar* (Endangered)
- Canada Lynx, *Lynx canadensis* (Threatened)
- Small Whorled Pogonia, *Isotria medeoloides* (Threatened)

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

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[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

New England Clean Energy Connect

2. Description

The following description was provided for the project 'New England Clean Energy Connect':

> Proposed CMP transmission line from Beattie Township to Pownal and Windsor to Wiscasset.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.722717009714806N70.03484380339984W

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. [Semantic] Is the project action area located within 0.25 miles of a known northern long-eared bat hibernaculum?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

6. [Semantic] Is the project action area located within 150 feet of a known occupied northern long-eared bat maternity roost tree?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type ‘0’ in questions 1-3.

1. Estimated total acres of forest conversion:

1038

2. If known, estimated acres of forest conversion from April 1 to October 31

1038

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type ‘0’ in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type ‘0’ in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type ‘0’ in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

EXHIBIT K: ENVIRONMENTAL INSPECTOR SPECIFICATIONS

SECTION 01340 – ENVIRONMENTAL INSPECTOR
Revised March 9, 2016

PART 1 – GENERAL

1.1 ENVIRONMENTAL INSPECTOR

1.1.1 The Environmental Inspector (EI) shall monitor and advise the Owner and the Construction Contractor(s) on construction of specific projects to ensure compliance with all laws and regulations, approved plans, permit conditions, and environmental best management practices, including, as appropriate: erosion and sedimentation control, construction mat placement, stormwater management, wetlands protection, rare plant species protection, stream buffer protection, and fugitive dust monitoring.

1.1.2 The EI shall ensure adequate environmental controls on the Projects.

1.2 ENVIRONMENTAL INSPECTOR RESPONSIBILITES

1.2.1 The EI shall conduct the following Work on the Projects:

1.2.1.1 Review with, and train as necessary, construction and erosion control crews in erosion control, mat usage, placement and maintenance, and permit compliance.

1.2.1.2 Notify the Field Construction Manager (FCM) of each day the EI intends to visit the Project Site, and what specific areas will be inspected.

1.2.1.3 Utilize IUSA's Environmental Guidelines, as well as all permits/licenses, drawings, and plans for the Project, as reference to ensure that all appropriate erosion and sedimentation controls are implemented proactively, to prevent erosion and sedimentation.

1.2.1.4 Establish high standards of environmental performance early on in the Project by communicating frequently with the FCM and other key Project/Construction Contractor personnel as to what is expected, what is working well and what is not working well. Proactively advise on all environmental aspects of the project, including the planning and implementation of work site access and all permit/license and regulatory compliance.

1.2.1.5 Advise the construction and erosion control crews on the efficient use of matting and erosion control devices to ensure they are not overused on the Project to in a way that negatively affects cost.

1.2.1.6 Immediately notify the FCM when the EI becomes aware of either practical opportunities to improve environmental protection, or of potential problems involving erosion and sedimentation control, construction mat use, stormwater management, wetland protection, wetland damage restoration, rare plant species protection, or stream buffers. Specifically:

1.2.1.6.1 If a Maine Department of Environmental Protection (MDEP) third-party inspector (3PI) has been assigned to a project, use 3PI reports as the basis/template for all EI reports, and respond to each 3PI recommendation by adding comments and follow-up actions after each 3PI recommendation.

1.2.1.6.2 Provide guidance to the Construction Contractor(s) to correct any erosion control installation or maintenance deficiencies noted in 3PI and/or EI reports, in a timely manner.

1.2.1.6.3 Provide written documentation of implementation status of all 3PI and/or EI recommended environmental controls.

1.2.1.6.4 Provide, within forty-eight (48) hours of all written 3PI reports, a written status report to include: a summary of all 3PI recommendations; concurrence with all 3PI recommendations with which EI agrees; and discussion of any 3PI recommendations with which EI disagrees.

1.2.1.6.5 Confirm in writing the adequate installation and maintenance of all erosion controls in each EI report.

1.2.1.6.6 Note and highlight any uncorrected erosion control deficiencies, including explanations, in each EI report.

1.2.1.6.7 If EI believes that 3PI field comments conflict with 3PI written report or recommendations, notify the Owner, request written clarification from 3PI, and request that MDEP be copied on this clarification.

1.2.1.6.8 Discuss and resolve any inconsistent or contradictory 3PI recommendations with the 3PI and MDEP, as necessary.

1.2.1.7 If the EI observes existing or potential problems in any area noted above, they shall not leave the work site without reporting the observation, as well as the recommended remedy, to the FCM. If the FCM is not available in this situation, the EI will communicate the problem and remedy directly to the on-site foreman or construction supervisor.

1.2.1.8 Upload reports of EI's observations every week to ProjectWise. Reports shall include the following content:

1.2.1.8.1 Project name,

1.2.1.8.2 Location of the areas inspected by the EI,

1.2.1.8.3 Description of the environmental compliance practices observed in the inspection,

1.2.1.8.4 Description on any areas of concern or non-compliance, as well as any measures to be undertaken by the Construction Contractor(s) to remedy the issues,

1.2.1.8.5 Photos of the areas inspected by the EI.

1.2.1.9 Before Construction activities begin on the Project, the EI shall sign off on the form in Appendix D that the EI understands the requirements of the Project Specifications to be able to enforce the Specification requirements on the Project Site with regard to environmental practices.

1.2.2 Inspection Frequency

1.2.2.1 After the initial construction start-up phase, the EI inspections shall average two (2) days per week or less, or as often as conditions (e.g., extent of disturbed soil areas; number of active work sites; stage of construction; season; and significant precipitation events) may require.

1.2.2.2 EI shall spend more time on the Project site in the early stages and less time later on as expectations are better understood and followed, and as the Contractor Contractor(s) has demonstrated its environmental proficiency.

1.2.2.3 The EI shall track weather forecasts and plan accordingly to inspect areas of the Project site most vulnerable to erosion or sedimentation, before and after significant precipitation events. The EI shall use their judgment as to whether frozen precipitation events pose the risk of erosion or sedimentation.

1.2.2.4 If there is a MDEP-required third-party inspector (3PI) assigned to a particular project, the EI shall coordinate their site inspections with those of the 3PI so that the EI and 3PI can share observations and recommendations, and discuss any areas of disagreement.

1.3 ENVIRONMENTAL INSPECTOR SKILLS AND ABILITIES

1.3.1 The EI shall have the following skills and abilities to work on the Project:

1.3.1.1 Self-directed and focused on achieving desired results.

1.3.1.2 Proven oral and written communication skills.

1.3.1.3 Ability to multitask.

1.3.1.4 Fluent in the use of Microsoft Office.

1.3.1.5 Proven environmental knowledge based on past work history.

1.3.1.6 Strong interpersonal skills with a strong customer service orientation.

1.3.1.7 Ability and willingness to travel within the assigned region or area.

1.4 ENVIRONMENTAL INSPECTOR EDUCATION AND EXPERIENCE

1.4.1 The EI shall have the following experience and training to work on the Project:

1.4.1.1 Direct related experience in construction and/or inspections of electrical transmission line, distribution line or substations:

1.4.1.1.1 Four (4) year degree in biology, ecology, environmental engineering, wetland science, or a related field and two (2) years of field experience, or,

1.4.1.1.2 Two (2) year degree in biology, ecology, environmental engineering, wetland science, or a related field and five (5) years of field experience, or,

1.4.1.1.3 Ten (10) years of relevant field experience.

1.4.1.1.4 The EI shall have at least a high school degree.

1.4.1.2 Knowledge of electric line and/or substation construction work.

1.4.1.3 Knowledge of applicable environmental regulations governing construction, including stormwater pollution prevention, wetlands, streams crossings and spill response.

1.4.2 The EI shall hold a valid driver's license.

EXHIBIT L: SUMMARY OF COMPENSATION TABLES

Summary of Compensation as Required by NRPA and/or the USACE

Resource Type & Impact	Agency Requiring	Form of Compensation	Type and Amount of Compensation
47.6 acres of Temporary Wetland Fill	Corps	Preservation and In-Lieu Fee	Preservation of 56.97 acres of wetlands (see Table below for details). $154,369.29
105.25 acres of Permanent Cover Type Conversion of Forested Wetlands[1]	Corps and MDEP	Preservation	Preservation of three parcels (Little Jimmie Pond, Flagstaff Lake and Pooler Pond Tracts), containing 439.41 acres of wetlands (see Table below for details).
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	$623,657.53
3.678 acres of Permanent Forested Wetland Conversion in SVPH			
0.719 acres of Permanent Upland Fill in SVP Habitat			
27.572 acres of Permanent Upland Conversion in SVPH			
Direct and Indirect Impact to Corps Jurisdictional Vernal Pools	Corps	In-Lieu Fee	$2,015,269.01
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		$3,046,648.37
	Land Preservation See Table below for Details		1,022.4 acres of preservation containing 510.75 acres of wetland.

[1]The Corps 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

Preservation Parcels Proposed for Wetland Mitigation and Considerations under the Corps' General Compensatory Mitigation Requirements

Parcel Name	**Little-Jimmie Pond Tract**	**Flagstaff Lake Tract**	**Pooler Pond Tract**
Town/Township	Manchester	Carrying Place & Dead River Townships	The Forks Plantation
County	Kennebec	Somerset	Somerset
Coordinates of Site Centroid (Lat/Long WGS 84):	44°16'18.21"N, 69°52'23.75"W	45°11'11.48"N, 70°9'42.41"W	45°17'25.16"N, 69°59'28.86"W
Biophysical Region	Central Interior	Western Mountains	Central Mountains
Watershed (HUC 8)	HUC 0103003	HUC 0103003	HUC 0103003
Closest NECEC Segment in associated HUC 8 Watershed	Segment 3	Segment 1	Segment 1
Total Parcel Acreage	109.77	831.39	81.24
Delineated Wetland Acreage	68.08	423.96	18.33
Considerations under the General Compensatory Mitigation Requirements (33 CFR 332.3 (h))			
Resources to be preserved provide important physical, chemical, or biological function for the watershed (Yes/No);	Yes	Yes	Yes
Resources to be preserved contribute significantly to the ecological sustainability of the watershed (Yes/No)	Yes	Yes	Yes
Preservation is determined by the district engineer to be appropriate and practicable (Yes/No);	Yes	Yes	Yes
Resources are under threat of destruction or adverse modifications (Yes/No); and	Yes	Yes	Yes
Site will be permanently protected through an appropriate real estate or other legal instrument (Yes/No).	Yes	Yes	Yes

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, (Basin Tract, Lower Enchanted Tract and Grand Falls Tract) 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	$1,875,000
Impact to Outstanding River Segments	MDEP	Preservation	Three preservation parcels, (Basin Tract, Lower Enchanted Tract, and Grand Falls Tract) offering 7.9 miles of frontage on the Dead River, an Outstanding River Segment
Habitat fragmentation and impacts to wildlife movement	MDEP	Conservation	Conservation of 40,000 in the vicinity of Segment 1
	Total Additional Monetary Contribution		$3,759,298.77
	Total Additional Land Preservation/Conservation		41,770.5 Acres