

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

SECTION 7. WILDLIFE, WETLANDS, AND FISHERIES

This section provides an overview of the wildlife, wetlands, and fisheries resources present in the Project area, and a summary of the impacts associated with the Project. More detailed information about particular resources are found in the following exhibits, which are referenced throughout this section:

- Exhibit 7-A includes a summary of the natural resources workplan and agency consultation.
- Exhibit 7-B includes a summary of Project impacts and the compensation for these impacts.
- Exhibit 7-C includes descriptions of the wetland, waterbody, and vernal pool resources within the Project.
- Exhibit 7-D includes findings from pre-construction surveys associated with Significant Wildlife Habitat.
- Exhibit 7-E includes findings from other pre-construction wildlife surveys based on Maine Department of Inland Fisheries and Wildlife (MDIFW) and/or U.S. Fish and Wildlife Service (USFWS) Guidelines.
- Exhibit 7-F includes the operational plans for the Project, including a summary and synthesis of *Myotis* fatalities at wind facilities, post-construction research and monitoring protocol, and water quality monitoring protocol.

7.1 PROJECT CONTEXT

The Project consists of the Turbine Area, North Generator Lead Line (North Line), and Bridal Path Generator Lead Line (Bridal Path Line). Section 1 of this application provides a summary of the components included in each portion of the Project.

The Project is located in Aroostook County, Maine. This area is part of the Laurentian Plains and Hills Ecoregion in northeastern Maine. The Laurentian Plains and Hills are characterized by spruce-fir forests with patches of deciduous trees interspersed with glacial lakes. Land within the Project is privately owned and the primary land use is industrial forestland managed for timber growth. Elevations in the Project range from approximately 500 to 1,300 feet (ft, approximately 150 to 520 meters [m]) above sea level.

Upland forests are a mixture of recent clear cuts, regenerating clear cuts, strip or partial cuts, overstory removal cuts, mature forest, and plantations. The dominant forest communities are Beech-Birch-Maple Forest¹ and Spruce-Northern Hardwoods Forest in various stages of

¹ 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.

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

regeneration. Common deciduous trees in the Project include maple (*Acer* spp.), beech (*Fagus* spp.), and birch (*Betula* spp.).

Forested, scrub-shrub, and emergent wetlands, as well as lakes, ponds, rivers, and small- to moderate-sized perennial and intermittent streams are located throughout the Turbine Area and along the generator lead corridors. Wetlands that occur on the ridgelines and hills are located primarily in natural topographic low points and drainages or have been created or enhanced by timber harvesting disturbances, such as skidder ruts and old ditches, which have developed into wetlands. Larger wetlands occur in lowlands and valleys between the ridgelines and are often associated with streams. Larger water courses also have associated floodplains that contain scrub-shrub and emergent wetlands.

7.2 AGENCY CONSULTATION AND DATA COLLECTION

Number Nine Wind Farm LLC (the Applicant), in coordination with Stantec Consulting Services Inc. (Stantec) and WEST, Inc. (WEST), conducted initial agency consultation with MDIFW, the Maine Department of Environmental Protection (MDEP), and USFWS to request information on known occurrences of rare, threatened, or endangered (RTE) species or their habitats located in the vicinity of the planned Project. Information available on the USFWS Information, Planning, and Conservation System (IPAC) database was also reviewed. In addition, publicly available information about existing natural communities and wildlife habitat in the vicinity of the Project was reviewed. The request letters, response letters, and emails are included in Exhibit 7-A.

In addition, the Applicant, Stantec, and WEST also conducted multiple agency consultation meetings with MDIFW and USFWS to discuss methodology and results of pre-construction surveys. A list of those meetings is included in Exhibit 7-A.

7.2.1 Data Collection

Stantec and WEST conducted a variety of natural resource and wildlife assessments and field surveys for the Project. These pre-construction surveys provided data to help assess the Project's potential impact to wildlife, wetlands, and fisheries. Surveys and assessments included:

- Wetland and Stream Delineations (2014 and 2015);
- Vernal Pool Surveys (spring 2008-spring 2010, spring 2014, spring 2015);
- Canada Lynx Habitat Assessment and Winter Track Surveys (winter 2014);
- Eagle and Raptor Nest Survey (spring 2014);
- Deer Wintering Area Surveys (winter 2014);
- Nocturnal Radar Migration Surveys (spring, fall 2014);
- Diurnal Raptor Migration Surveys (spring, fall 2014);
- Eagle Observation Surveys (fall 2013; spring, summer 2014);
- Acoustic Bat Surveys (spring, summer, fall 2014); and
- Supplemental Bat Surveys (summer, fall 2014).

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

The scope and methods were based on standard pre-construction survey methods for proposed wind projects (i.e., guidelines outlined by the USFWS and MDIFW²) and are consistent with other studies conducted recently in Maine and in the Northeast. The scope and methodology for these surveys was confirmed through development of a natural resources workplan reviewed and discussed with MDIFW and USFWS. The workplan is included in Exhibit 7-A.

7.3 PROJECT IMPACTS AND COMPENSATION

7.3.1 Project Impacts

Based on information gathered in these surveys, the Project layout was designed to optimize engineering and wind resource conditions and where possible, to avoid environmental impacts, or when otherwise impracticable, minimize those impacts. The potential impacts to wildlife, wetlands, and fisheries are described further in the following subsections.

7.3.2 Compensation

The Applicant will compensate for the impacts to wetlands, significant vernal pools, and Inland Wading Bird and Waterfowl Habitat (IWWH) through Maine's In-Lieu Fee program. Exhibit 7-B2, Table 1 provides a summary of the compensation that yields an in-lieu fee calculation of \$7,319,169.

The Applicant will compensate for the impacts to streams by replacing 7 additional culverts in locations where improvements are not needed for the Project. These culvert replacements will provide a positive habitat value. (Exhibit 7-B2, Table 2).

7.4 WETLANDS

The following is a brief summary of all wetland and waterbody resources identified within the Project:

- 1,917 wetland resources regulated by the U.S. Army Corps of Engineers (Corps), MDEP, and the Maine Land Use Planning Commission; and
- 369 wetland resources are considered Wetlands of Special Significance (WoSS).

A complete discussion of the methodology and results for the wetland and stream delineation surveys is included in Exhibit 7-C.

² MDIFW Wind Power Preconstruction Study Recommendations (April 2014) and USFWS Land-based Wind Energy Guidelines (2012).

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

The wetland impacts associated with the construction and operation of the Project total 9.6 acres of permanent wetland fill, 29.5 acres of temporary wetland fill³, and 276.7 acres of permanent cover type conversion. The impacts are described further in Exhibit 7-B1, Table 1 and the compensation for these impacts are described further in Exhibit 7-B2, Table 1.

7.5 VERNAL POOLS

The following is a brief summary of the vernal pools identified within the Project:

- 331 vernal pools;
- 76 pools were determined to be naturally occurring; and
- 39 of the naturally occurring pools were identified as a Significant Vernal Pool (SVP). Based on the definitions set forth in the Natural Resources Protection Act (NRPA), a vernal pool must be natural to be considered an SVP;

A complete discussion of the methodology and results for the vernal pool surveys is included in Exhibit 7-C. Vernal pool forms for 126 of the vernal pools were submitted to MDIFW in August 2014, prior to the submission of this application.

The impacts to SVPs associated with the construction and operation of the Project total 0.0 acres of permanent fill and 0.6 acres of clearing. The impacts to terrestrial habitat within 250 feet of a SVP are 0.2 acres of permanent wetland fill, 0.5 acres of temporary wetland fill, and 5.7 acres of clearing in wetlands. The impacts are described further in Exhibit 7-B1, Table 2 and the compensation for these impacts are described further in Exhibit 7-B2, Table 1.

7.6 STREAMS AND FISHERIES

The following is a brief summary of all streams identified within the Project:

- 330 streams or segments of a stream; and
- 149 streams are perennial or have a perennial segment.

Portions of the Bridal Path Line corridor are located within a watershed designated as Critical Habitat for Atlantic salmon (*Salmo salar*). Nine perennial streams are located within this Critical Habitat. Additional information is provided in Section 7.7.1.

Several of the streams in the Project are identified by MDIFW as valuable fisheries habitat for wild brook trout (*Salvelinus fontinalis*).

³ Temporary wetland fill includes temporary timber mats used to support clearing and construction activities in wetlands, temporary road fill at temporary culvert locations, and temporary stockpiles next to underground electrical collection. As described in Section 14, this temporary fill will be removed following construction and the disturbed area will be allowed to naturally revegetate.

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

The impacts associated with the construction and operation of the Project include permanent fill to 105 linear feet of perennial streams, 256 linear feet of intermittent streams, and 0 linear feet of ephemeral streams; temporary fill to 1,003 linear feet of perennial streams, 726 linear feet of intermittent streams, and 129 linear feet of ephemeral streams. The impacts are described further in Exhibit 7-B1, Table 3. The Applicant has proposed mitigation for these impacts that will have a net conservation benefit, including replacement of poorly placed or inadequately designed culverts with culverts that meet or exceed Corps design standards, as described in Exhibit 7-B2, Table 2. This mitigation includes replacement of 5 culverts in locations where culvert replacement is not necessary for the Project but where replacement will provide a benefit to habitat by reducing sedimentation and allowing for fish and amphibian passage. Two of these culverts were improperly installed over a wide stream in T9R3 and will be replaced with a 60-foot bridge. Replacing these 2 constrictions with a broad unconfined channel will completely remove a significant barrier, providing a substantial opportunity for habitat expansion and improvement.

A complete discussion of the methodology and results for the stream delineations is included in Exhibit 7-C. Details of the protection measures to preserve water quality, which comply with state and federal requirements, are included in Exhibit 1-B (Project Designs), as well as Section 10 (Buffers) and Section 12 (Stormwater Management). In addition, the Applicant has proposed to conduct water quality monitoring for the Project, as described in Exhibit 7-F3.

7.7 WILDLIFE

7.7.1 Significant Wildlife Habitat

As defined by the Maine NRPA (M.R.S.A. 38 §480-B), Significant Wildlife Habitat includes the following resources as mapped by MDIFW or located within any other protected natural resource:

- Habitat for species appearing on the official state or federal list of endangered or threatened animal species;
- High and moderate value deer wintering areas (DWAs) and travel corridors;
- Seabird nesting islands;
- Critical spawning and nursery areas for Atlantic salmon as defined by the Department of Marine Resources;
- SVP habitat;
- High and moderate value IWWH, including nesting and feeding areas; and
- Shorebird nesting, feeding, and staging areas.

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

The following identifies Significant Wildlife Habitats known or expected to occur within the Project.⁴

Designated Critical Habitat: Canada Lynx

The USFWS has designated Critical Habitat for the Canada lynx (*Lynx canadensis*) in the northern half of Maine. The Canada lynx is federally listed as a threatened species and is identified by MDIFW as a species of special concern.

The Turbine Area and portions of the North Line are located within the species' designated Critical Habitat (Figures 7-1, 7-2). The Bridal Path Line is not located within designated Critical Habitat (Figure 7-3).

Stantec conducted a desktop habitat assessment with field verification and winter lynx snow track surveys in winter 2014 (Exhibit 7-D1). The scope and methods were developed, discussed with, and approved by MDIFW and USFWS, and followed MDIFW's Western Mountains Eco-Regional Lynx Track Protocol. Based on the habitat assessment, Stantec estimated that approximately 6.4 percent of the area within 1 mile of the proposed turbine locations and 10.6 percent of the area within 1,000 feet of either side of the North Line and Bridal Path Line contain high- and moderate-value habitats that may currently support relatively high densities of snowshoe hare, the lynx's preferred and primary food source. The habitat assessment identified abundant potential snowshoe habitat throughout the townships included in the assessment.

Stantec also conducted lynx snow track surveys on 3 visits between January and April 2014. These surveys recorded 84 lynx track intercepts throughout the Project area and observed 1 lynx on the survey route.

As discussed in Exhibit 7-D1, lynx and snowshoe hare habitat is dynamic and constantly changing as a result of forest succession and the actively managed forest landscape. Past forestry practices within the Project area and the surrounding region have created favorable conditions with regenerating softwood stands dominating the landscape. Habitat loss and conversion will occur within some of the blocks identified as potential and future snowshoe hare habitat; however, many identified blocks will remain. The identified snowshoe hare habitat, both within and beyond the Project, occur in areas that are primarily managed for timber production. Timber management activities within this landscape, including thinning, canopy removal and road construction, regularly alter available habitat and will likely continue to provide a landscape with a variety of available snowshoe hare and Canada lynx habitat. Future habitat availability and use of available habitat by Canada lynx cannot be reasonably predicted; however, wildlife populations that occupy this landscape have historically adapted to continual habitat conversion that occurs with timber management. Future management of the surrounding land for timber production will require wildlife population to continue to adapt to

⁴ The Project is not located near, and does not include any impacts to seabird nesting islands; critical spawning and nursery areas for Atlantic salmon; or shorebird areas.

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

the changing landscape and as such, changes associated with the proposed Project are not expected to adversely affect these local populations, or the habitat supporting those populations.

During construction and operation of the Project, Canada lynx may be at risk of collision with vehicles. There is already a risk of collision in the vicinity of the Project due to an extensive road network with active forestry activity. In order to minimize impact specifically from Project activity, the Project will have a posted limit of 5 miles per hour for the laydown areas, 15 miles per hour for access roads, and 30 miles per hour for all other roads. In addition, all Project personnel and contractors will participate in training related to the appropriate speed limits.

Designated Critical Habitat: Atlantic Salmon

The USFWS has designated Critical Habitat for the freshwater geographic range occupied by the Gulf of Maine Distinct Population Segment of Atlantic salmon, including all perennial streams, rivers, and lake habitats connected to the marine environment (50 CFR 226: Federal Register, June 19, 2009).

The Turbine Area and the North Line do not occur within any designated Critical Habitat for Atlantic salmon (Figure 7-1, Figure 7-2).

A portion of Bridal Path Line, approximately 15 miles in TA R2 WELS, Forkstown Twp, and Haynesville, is located within the designated Critical Habitat (HUC 10 0102000302 East Branch Mattawamkeag River and HUC 10 0102000301 West Branch Mattawamkeag River) (Figure 7-3). The landscape within this portion of the designated Critical Habitat is primarily forested. Streams and waterbodies were delineated as part of wetland delineation surveys. Based on these surveys, the corridor will cross 9 perennial streams within the designated Critical Habitat (Exhibit 7-C).

These perennial streams will receive buffer protections for salmon streams as described in Section 10 of this application. A 100-foot buffer will be established around perennial streams to provide enhanced protection to these streams. Enhanced construction design criteria and clearing and maintenance restrictions will provide additional shading of perennial streams crossing the Right-of-Way to the maximum extent allowed by the safety considerations. Section 10.7 of this application provides additional details on buffer clearing, construction, and maintenance procedures for these streams.

The Project does not include any in-stream work or permanent crossings of streams within designated Critical Habitat. The Project includes 1 temporary construction crossing within designated Critical Habitat. This crossing will be a temporary mat bridge that will fully span the stream with no in-stream work, and therefore, changes associated with the proposed Project are not expected to adversely affect Atlantic salmon, or the associated habitat.

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

Deer Wintering Areas

DWAs provide important refuge for white-tailed deer (*Odocoileus virginianus*) during the winter months in northern climates and are typically characterized by an extensive forest stand of mature softwood species with a dense forest canopy.

DWA are mapped in the Project area associated with the Bridal Path Line (Figure 7-3). The Turbine Area and North Line do not include any impacts to DWA (Figures 7-1, 7-2).

A portion of Bridal Path Line, approximately 2.3 miles in Haynesville, crosses 2 DWAs mapped by MDIFW (#100068 and #100075). During the winter of 2014, Stantec conducted surveys of these DWAs to assess use and habitat characteristics (Exhibit 7-D2). The surveys indicated that both DWAs may be providing suitable cover. The construction of the corridor has the potential to remove contiguous softwood shelter and/or fragment existing or potential travel corridors through the DWAs.

The Applicant has proposed measures to minimize impacts to these DWAs. As described in Section 10.10, clearing and maintenance procedures will minimize the impacts to DWA during the construction and operation of the Bridal Path Line.

Significant Vernal Pool Habitat

As described in Section 7.5, SVPs were identified in the Project area associated with the Turbine Area, North Line, and Bridal Path Line.

The Project design proposes no direct impacts to the pool depressions of the SVPs; however, the Project will result in impacts to the critical terrestrial habitat within 250 feet of 34 SVPs. The impact will be less than 25% of the total critical terrestrial habitat surrounding 27 of the SVPs. The remaining 7 SVPs will have greater than 25% impact and compensation will be provided for these impacts.

The Applicant has proposed measures to avoid and minimize Project impacts to SVPs in the Project area, as described in Section 10.10. A minimum 100-foot vegetated buffer will be maintained for all SVPs. Section 10.7 of this application provides additional details on buffer clearing, construction, and maintenance procedures for these SVPs.

The impacts are described further in Exhibit 7-B1, Table 4. The Applicant has proposed compensation for these impacts as described in Exhibit 7-B2, Table 1.

Inland Waterfowl and Wading Bird Habitat

IWWHs are habitats mapped by MDIFW that contain an inland wetland complex used by waterfowl and wading birds, plus a 250-foot upland buffer surrounding the wetland. The upland buffer is considered to be part of the mapped habitat.

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

IWWH are mapped in the Turbine Area (Figure 7-1). An overhead collection line and access road crosses 1 IWWH (UMO-2732) associated with South Brook. An access road crosses 1 IWWH (UMO-2457) associated with Hoyt Brook and the North Branch of the Meduxnekeag River. An access road crosses 1 IWWH (UMO-2498) associated with the East Branch of Presque Isle Stream.

The North Line does not include any impacts to IWWH (Figure 7-2).

IWWH are mapped in the Bridal Path Line portion of the Project (Figure 7-3). Portions of the Bridal Path Line cross 2 IWWH in TA R2 WELS. Approximately 0.34 miles of the corridor crosses UMO-4997 and approximately 1.17 miles of the corridor crosses UMO-4680.

The impacts are described further in Exhibit 7-B1, Table 5. The Applicant has proposed compensation for these impacts as described in Exhibit 7-B2, Table 2.

The Applicant has also proposed measures to minimize impacts to these IWWH, including removal of only “capable trees” within the buffer during construction and maintenance. As described in Section 10.9, clearing and maintenance procedures will minimize the impacts of the Project.

7.7.2 Pre-Construction Wildlife Surveys

In addition to the surveys conducted for significant wildlife habitat, additional pre-construction avian and bat surveys were conducted. A discussion of the methodology and results for those surveys is included below, along with a discussion of the potential impacts from the Project. Figure 7-4 includes the survey locations along with the Project design, as described in Section 1.

Night-Migrating Songbirds

In spring and fall 2014, Stantec conducted radar surveys to characterize migrating patterns of night-migrating birds (Figure 7-4; Exhibit 7-E1). Methods were based on recommendations from MDIFW and were consistent with other surveys conducted in the region. An X-band marine radar system was deployed on Saddleback Mountain and nightly surveys were conducted for 20 nights during the spring survey period (April 28 to June 8, 2014) and for 20 nights during the fall survey period (September 4 to October 8, 2014). During the spring, the overall mean passage rate was 402 ± 27 targets per kilometer per hour (t/km/hr) and the seasonal mean flight height was 357 ± 2 m (1,171 ft). During the fall, the overall mean passage rate was 247 ± 18 targets per kilometer per hour (t/km/hr) and the seasonal mean flight height was 354 ± 2 m (1,161 ft). NEXRAD weather radar images from Hodgdon, Maine were used to confirm that the nights selected for sampling on Saddleback Mountain were representative of seasonal migration activity throughout the region.

As discussed in Exhibit 7-E1, the overall mean and nightly passage rates, seasonal and nightly mean flight heights, and mean seasonal flight direction were within the range of results at proposed projects in Maine and in the eastern United States. These results suggest that nocturnal

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

migrant exposure to the Project would result in impacts similar or less than what has been recorded at other wind projects in the region.

A complete discussion of the methodology and results for the radar surveys is included in Exhibit 7-E1.

Raptors

In 2013 and 2014, WEST conducted multiple surveys to evaluate proximity to raptor nests, characterize raptor migration activity, and to characterize eagle and other raptor activity levels. These surveys included raptor nest surveys, raptor migration surveys, and eagle observation surveys (Figure 7-4; Exhibits 7-E2, 7-E3, 7-E4).

In spring and summer 2014, WEST conducted aerial surveys for bald eagle (*Haliaeetus leucocephalus*; a species of special concern in Maine; also protected under the federal Bald and Golden Eagle Protection Act) and other raptor nests and for great blue heron (*Ardea herodias*; a species of special concern in Maine) rookeries (Exhibit 7-E2) surrounding the Turbine Area portion of the Project. The nest surveys followed methods suggested in the USFWS 2013 Eagle Conservation Plan Guidance and were reviewed and approved by USFWS and well as recommendations from MDIFW (Exhibit 7-A). Two surveys were conducted in April and June 2014 during the time period with the highest probability of detecting female bald eagles incubating eggs or adults tending young based on recommendations from MDIFW. Eagle nest surveys were conducted within 10 miles of proposed turbine locations and nest surveys for non-eagle raptors and heron rookeries focused on the area within 4 miles of proposed turbine locations.

Three bald eagle nests, 2 osprey (*Pandion haliaetus*), 2 unknown raptor nests, and 1 common raven (*Corvus corax*) nest were located during the aerial surveys. The nearest bald eagle nest is approximately 2 miles from the closest proposed turbine location. The nearest other raptor nest is an osprey nest within the great blue heron rookery, 2.1 miles from a proposed turbine location. Two great blue heron rookeries were located, 1 was located within 1 mile of a proposed turbine location and 1 was located approximately 2.1 miles from a proposed turbine location.

No mapped bald eagle nests are located within ¼ mile of the North Line or the Bridal Path Line (Exhibit 7-E2).

As discussed in Exhibit 7-E2, the nesting density for bald eagle and osprey is low (<0.01 nests/square mile). There is little foraging opportunity within 1 mile of proposed turbine locations, particularly when compared to foraging habitat available in the landscape surrounding the Project. Therefore, the Project is unlikely to attract foraging bald eagle that may be nesting in the area. The available evidence suggests that risk of collision and/or displacement of nesting bald eagle and other raptors are generally low.

As discussed in Exhibit 7-E2, great blue herons do not appear to be particularly susceptible to collisions with wind turbines and account for less than 0.1% of fatalities documented during post-

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

construction monitoring at North American wind facilities. Available evidence suggests that herons may actively avoid wind turbines.

A complete discussion of the methodology and results for the nest surveys is included in Exhibit 7-E2.

In spring and fall 2014, WEST conducted raptor migration surveys to provide information regarding level of use by raptors within the Turbine Area portion of the Project during the migration seasons (Figure 7-1; Exhibit 7-E4). The surveys followed methods based on recommendations from USFWS and MDIFW and also on discussions with MDIFW (Exhibit 7-A). Surveys were conducted on Number Nine Mountain, which provided good visual 360-degree coverage in a central location in the Project area. Surveys were conducted approximately twice per week for approximately 6 hours per survey day.

During spring, surveys were conducted for 129 hours during 22 days from March 18 to May 29, 2014. A total of 34 individual raptors, representing 8 unique species, and 54 vultures, representing a single species, were recorded during the surveys.

During fall, surveys were conducted for 168 hours during 34 days from September 1 to December 4, 2014. A total of 67 individual raptors, representing 8 unique species, and 115 vultures, representing a single species, were recorded during the surveys.

No state listed raptor species were documented. Two state species of special concern were documented. One observation of northern harrier (*Circus cyaneus*) was documented during fall surveys. Thirty observations of bald eagle were documented.

In 2013 and 2014, WEST conducted eagle observation surveys to provide information regarding levels of use by bald eagles and golden eagles (*Aquila chrysaetos*) within the Turbine Area portion of the Project (Exhibit 7-E3). The surveys followed methods described in the USFWS Eagle Conservation Plan Guidance, and protocol was approved by USFWS. Surveys were conducted 4 times at each of 21 survey points during the fall survey period (September 5 to November 24, 2013) and approximately 3 times at each of 32 survey points during both the spring survey period (March 3 to June 15, 2014) and summer survey period (June 16 to August 28, 2014). In total, 250 60-minute surveys were conducted. Eleven bald eagle observations were recorded during the surveys; no golden eagles were observed. Bald eagles were observed at 8 of the survey locations.

Additional observations of raptors were also documented during eagle observation surveys conducted from September 2013 to August 2014 (Exhibit 7-E3). A total of 58 raptors were recorded along with 13 vultures. The greatest number of raptors were observed in the fall and spring, while fewer were observed during the summer, consistent with expected trends for higher relative raptor abundance during known migration periods. Two state-listed raptor species were observed, including 1 peregrine falcon and 1 northern harrier.

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

The low abundance of raptors observed suggests that raptor exposure to the Project would result in impacts similar or less than what has been recorded at other wind projects in the region.

An Eagle Conservation Plan will be developed for the Project in coordination with USFWS. Consistent with the Eagle Conservation Plan Guidance, the Eagle Conservation Plan will document how the Applicant is complying with the regulatory requirements for programmatic eagle take permits by avoiding and minimizing the risk of taking eagles through its siting, configuration, and operation of the Project.

A complete discussion of the methodology and results for the eagle observation surveys is included in Exhibit 7-E3. A complete discussion of the methodology and results for the raptor surveys is included in Exhibit 7-E4.

Bats

In 2014, WEST conducted multiple acoustic surveys to evaluate activity levels and spatial/temporal variation in activity, as well as species composition. These surveys included acoustic surveys at fixed and temporary stations, driving transect surveys, and northern long-eared bat (*Myotis septentrionalis*) presence/absence surveys (Exhibits 7-E5 and 7-E6).

Acoustic fixed surveys were conducted at 41 different stations throughout the Project, representing 4 heights. Fixed station acoustic surveys were conducted at 4 met tower stations from April 28 to October 16, 2014. Four detectors were placed near the ground and 4 were elevated to a height of either 20 m or 40 m. At the request of MDIFW, canopy (tree) station surveys were conducted at 2 locations from August 20 to October 16, 2014, at heights of approximately 8 m. Ground station surveys were conducted at 35 temporary stations from April 28 to October 16, 2014 at heights of approximately 1.5 m.

The paired detector units placed at met towers recorded 338 bat passes during 1,199 detector-nights. Met tower units recorded a combined mean (\pm standard error) of 0.25 ± 0.02 bat passes per detector-night. Ground-based detectors at met towers recorded an average bat pass rate of 0.30 ± 0.03 bat passes per detector-night, and raised detectors recorded 0.22 ± 0.03 bat passes per detector-night. The detectors placed at temporary stations recorded 841 bat passes during 392 detector-nights; the average bat activity recorded at bat feature locations was 1.79 ± 0.24 bat passes per detector-night.

Bat activity at met towers varied substantially between seasons, with low activity in the spring (0.11 ± 0.04 bat passes per detector-night) and higher activity in summer (0.26 ± 0.04) and fall (0.32 ± 0.05).

At the request of MDIFW, acoustic driving surveys were conducted along a 30-mile transect for 15 nights between August 20 and October 14, 2014. A total of 26 call sequences from acoustic transect surveys were recorded and analyzed.

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

A complete discussion of the methodology and results for these surveys is included in Exhibit 7-E5.

In addition to these acoustic surveys, WEST also conducted northern long-eared bat acoustic presence/absence surveys within the Turbine Area. Based on a desktop assessment of summer habitat, 84 sites were selected for acoustic surveys consistent with USFWS Guidelines and were reviewed and approved by USFWS (Exhibit 7-A). At these sites, 25 detectors were deployed for 2 to 5 nights, for a total of 207 detector nights from July 15 to July 21, 2014. The presence of northern long-eared bat was not verified at any of these sites surveyed within the Project. A complete discussion of the methodology and results for these surveys is included in Exhibit 7-E6.

Levels of acoustic bat activity were generally low compared to rates reported at other wind projects in Maine and the Northeast. Over 90 percent of all acoustic data recorded were generated by low-frequency echolocating bats (hoary bat, silver-haired bat, big brown bat).

USFWS published a final listing decision and interim rule on the northern long-eared bat, listing the bat as threatened. The northern long-eared bat has also been proposed to be listed as endangered by MDIFW; a recommendation has been presented to the state legislature. No evidence of northern long-eared bat was documented from any acoustic survey source, including USFWS presence/absence surveys; fixed stations at met towers; temporary stations in canopy gaps, forest edges, and wetlands; canopy stations in a forest clearing and along a forested stream corridor; or acoustic driving transects. These results provide strong evidence of the absence of northern long-eared bats within the Turbine Area.

The little brown bat (*Myotis lucifugus*) has been proposed to be listed as endangered by MDIFW; a recommendation has been presented to the state legislature. Fewer than 5 little brown bat call sequences (Kaledioscope, n=2; BCD, n = 5; EchoClass, n = 0) were identified between April 28 and October 16, 2014.

The eastern small-footed bat (*Myotis leibii*) has been proposed to be listed as threatened by MDIFW; a recommendation will be presented to the state legislature in 2015. No eastern small-footed bat call sequences were identified.

Mean bat activity at the Project was lower than the national median and the majority of wind project pre-construction bat studies available from the Northeast. In addition, estimated fatality rates for bats at wind facilities in Maine have been among the lowest in North America. This suggests that bat fatality rates for the Project may be very low. In addition, given that no northern long-eared bats were recorded and very few little brown bat calls were recorded, the risk to *Myotis* bats is also expected to be very low.

7.8 OPERATIONAL PLANS

The results of the pre-construction surveys suggest that risk to bird and bat species is generally low and expected to be similar to results documented at other operating wind projects in Maine

NUMBER NINE WIND FARM MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION

Section 7.
Wildlife, Wetlands, and Fisheries

and New England. The Applicant recognizes that MDIFW has requested operational adjustments and monitoring during operation; therefore the Applicant has proposed plans for curtailment, mortality monitoring, meteorological tower maintenance, and water quality monitoring.

7.8.1 Curtailment

WEST conducted a summary and synthesis of *Myotis* fatalities at wind facilities, with a focus on northeastern North America (Exhibit 7-F1). This summary included a review of 182 publicly available post-construction fatality studies and focuses on what is known about *Myotis* fatalities. This summary recognized 2 general patterns: 1) migratory tree bats (hoary bat, eastern red bat, and silver-haired bat) composed an estimated 78% of all bat fatalities recorded between 2000 and 2011; and 2) the majority of fatalities occur during the fall migratory period, with increase in carcass discoveries typically beginning in late July and peaking in August.

With respect to *Myotis* species, northern long-eared bat appear to be at very low risk for fatality at wind facilities, composing 0.3% of total fatalities, 0.5% of fatalities in the Northeast, and 0.0% of fatalities in Maine. Similarly, eastern small-footed bats appear to be at very low risk, with only 2 known fatalities. Little brown bats compose 8.1% of all bat fatality records, 12.2% within the Northeast, and 13.0% within Maine. As with bats in general, *Myotis* bat fatalities appear to occur primarily in fall, and in Maine, over half of the little brown bat fatalities are known to occur in August. The summary notes that total and estimated bat fatalities from wind facilities in Maine are very low (average 0.84 bats/MW/study period; median 0.45 bats/MW/study period) compared to other wind facilities in the region and to North America as a whole. Bat mortality at the Project is expected to be similar to other operating wind projects in the region.

The summary also included a synthesis of studies conducted to investigate the effectiveness of curtailment treatments, as wind speed seems to be one of the main predictors of risk to bats at wind facilities. Data from the studies investigating the effects on bat fatalities from forgoing energy production at lower wind speeds suggest that feathering turbine blades below wind speeds in the range of 4.0 to 4.5 m/s can reduce *Myotis* fatalities by 90% or more.

The Applicant is committed to minimizing the impact the Project may have on bats by implementing turbine operational adjustments to insure that bat mortality at the Project is reduced by 50% when compared to normally operating turbines (Exhibit 7-F2). Numerous studies have shown that increasing turbine cut-in speed (the wind speed at which the turbine begins producing electricity) and feathering turbine blades under the cut-in speed (slowing or stopping rotation of turbine blades) have a positive effect on reducing bat mortality caused by turbines. To achieve this goal, the Project will conduct research to study the effect of feathering the turbine blades under varying wind speeds during the entire study period, and choose which wind speed best meets the goal while maximizing energy production.

The research study will include all 119 turbines and each turbine will be assigned to 1 of 3 treatments during the entire duration of the study period, namely a cut-in speed of 3.0, 4.0, or 5.0

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

m/s. The study will be conducted from April 15 to October 15 during years 1 and 2 of Project operation, and treatments will be in place every night from one-half hour before sunset to one-half hour after sunset. Exhibit 7-F2 describes the study design, methods, and reporting for the research study.

7.8.2 Post-Construction Mortality Monitoring

The Applicant has proposed to conduct post-construction monitoring for mortality of birds and bats from turbines, as described in Exhibit 7-F2. The monitoring will occur during the spring, summer, and fall seasons (April 15 to October 15) for years 1 and 2 of Project operation. This timeframe includes the spring and fall migration periods as well as the summer breeding season for birds and bats. All turbines will be monitored, which is greater than the recommendations of MDIFW and USFWS. Exhibit 7-F2 describes the protocol for standardized carcass searches, including search plot, search methods, data collection, bias trials, and statistical methods.

The protocol does not propose post-construction bat and avian use surveys. Pre-construction acoustic bat surveys documented very low bat activity; therefore post-construction acoustic surveys would not provide additional information to address potential risk to bats. Nocturnal radar surveys are not proposed because pre-construction surveys documented low passage rates and because no correlation has been demonstrated between radar surveys and mortality. The protocol also does not include raptor migration monitoring surveys because pre-construction surveys documented low passage rates and the risk of raptor collision with wind turbines is very low in New England, with only 4 recorded fatalities from all wind projects and associated generator lead facilities.

In addition, to address potential risks to birds and bats, a Bird and Bat Conservation Strategy will be developed for the Project in coordination with USFWS, which will include measures the Project will implement to avoid and minimize impacts to birds and bats in general, and an adaptive management plan with triggers and responses to minimize impacts to birds and bats.

7.8.3 Meteorological Tower Maintenance

The Project will include up to 4 permanent meteorological ("met") towers and 4 temporary met towers. The temporary met towers will include guy wires. Any met tower that includes guy wires will be installed with diverters of the "flapper" variety and will be staggered at the manufacturer's suggested rate and spacing for each guy wire. Project operations staff will inspect the condition of the diverters twice per year, before the spring and fall migration period. All met towers that include guy wires will include sleeves over the guy wires that extend from ground level up to approximately 12-15 feet in vertical height. Any excess wire that is necessary for future use will be tied off at a height of 20-25 feet above the ground.

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

7.8.4 Water Quality Monitoring

Details of the protection measures to preserve water quality, which comply with state and federal requirements, are included in Volume 4 (Project Designs), as well as Section 12 (Stormwater Management).

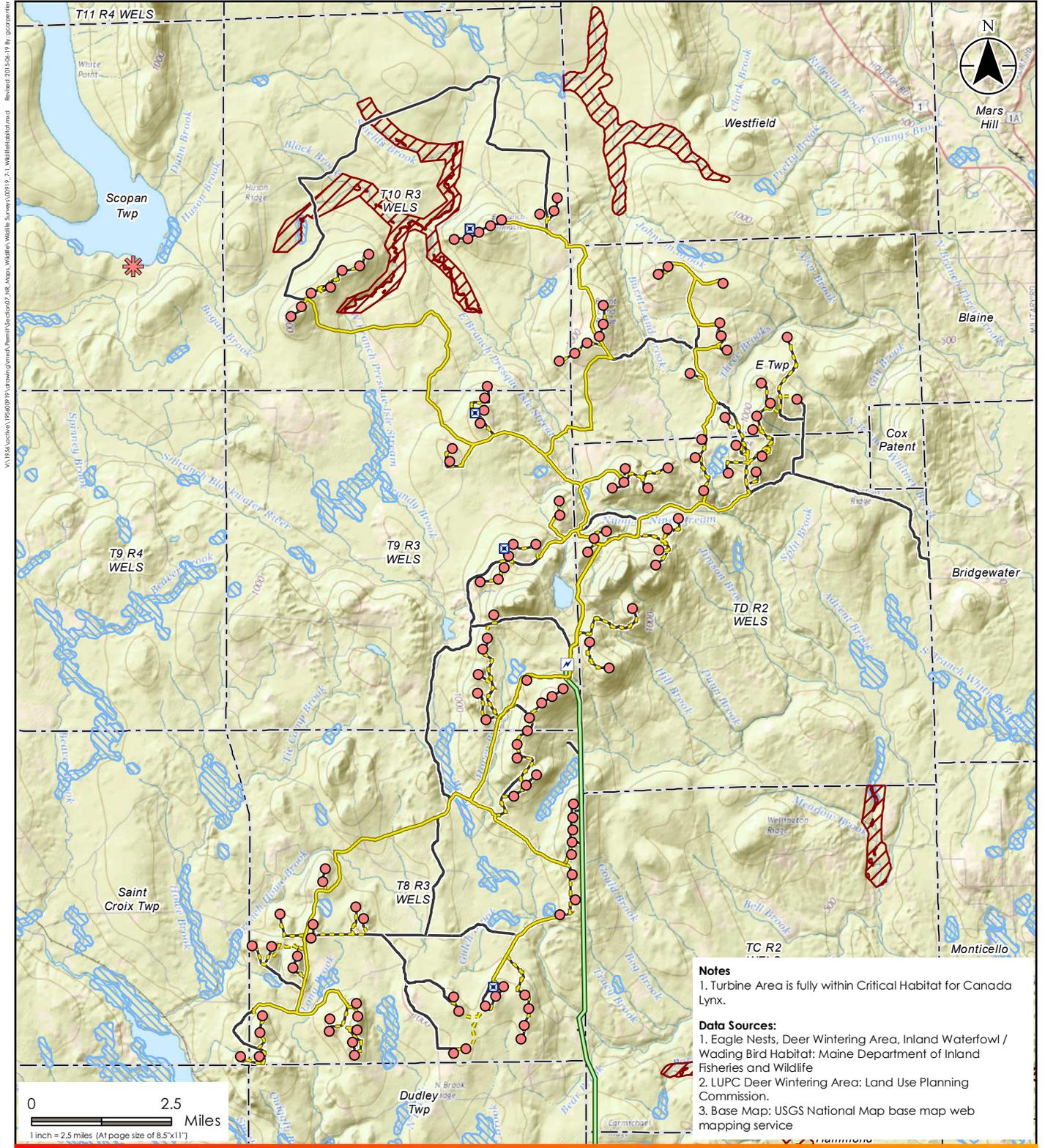
The Applicant has also proposed to conduct water quality monitoring for the Project, as described in Exhibit 7-F3.

**NUMBER NINE WIND FARM
MDEP NRPA/SITE LOCATION OF DEVELOPMENT COMBINED APPLICATION**

Section 7.
Wildlife, Wetlands, and Fisheries

FIGURES

- 7-1 Significant Wildlife Habitat – Turbine Area
- 7-2 Significant Wildlife Habitat – North Generator Lead
- 7-3 Significant Wildlife Habitat – Bridal Path Generator Lead
- 7-4 Locations of Pre-Construction Wildlife Surveys



Notes
 1. Turbine Area is fully within Critical Habitat for Canada Lynx.

Data Sources:
 1. Eagle Nests, Deer Wintering Area, Inland Waterfowl / Wading Bird Habitat: Maine Department of Inland Fisheries and Wildlife
 2. LUPC Deer Wintering Area: Land Use Planning Commission.
 3. Base Map: USGS National Map base map web mapping service

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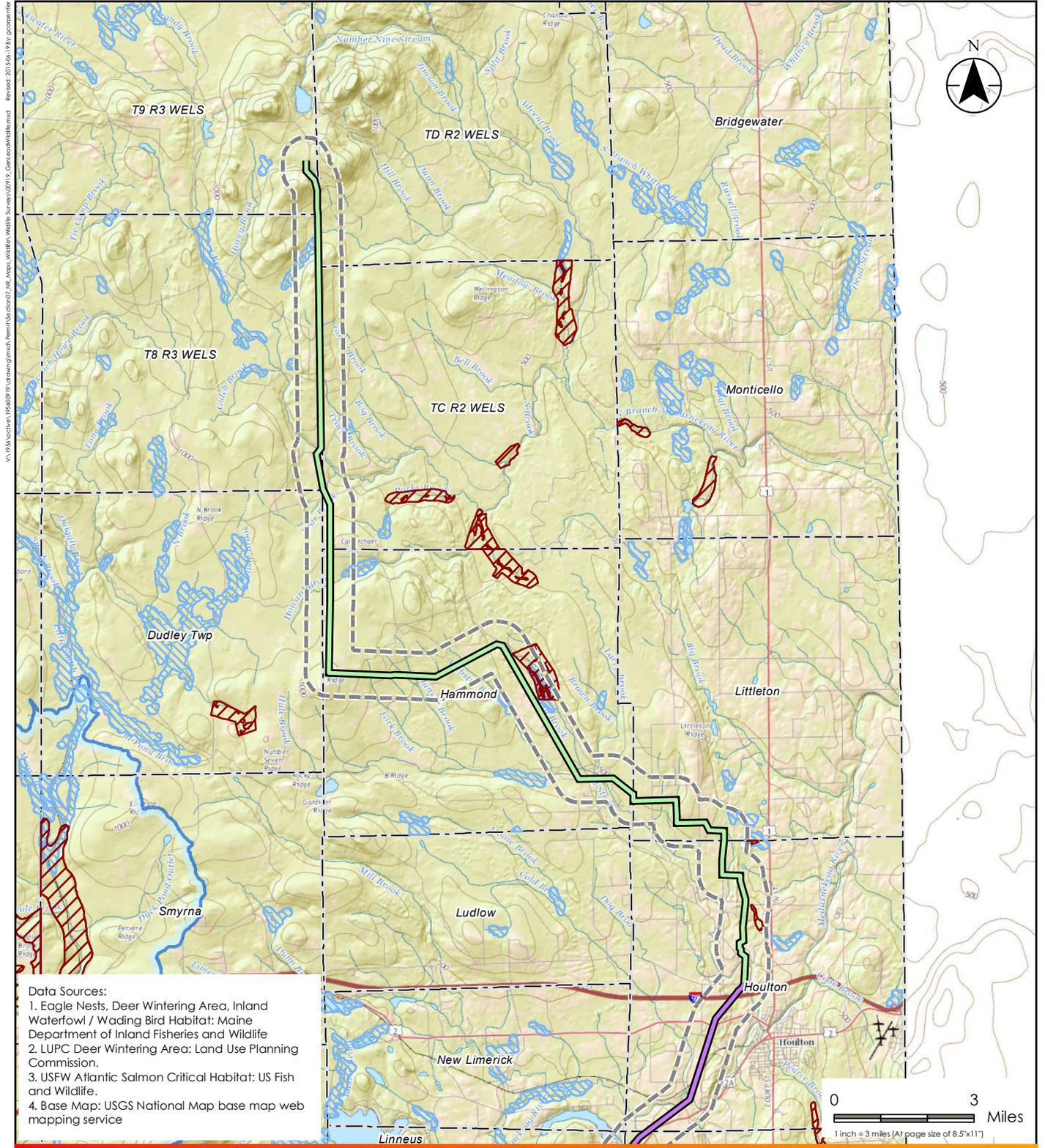
- Legend**
- Turbines
 - ✳ Mapped Eagle Nests (2013)
 - MDIFW/LUPC Deer Wintering Area
 - MDIFW Inland Waterfowl / Wading Bird Habitat
 - Permanent MET Tower
 - Substation/O&M Building
 - North Generator Lead
 - Overhead Collector
 - Underground Collector
 - Access Road

Client/Project
 EDP Renewables North America LLC
 Number Nine Wind Farm
 Arostook County, Maine

Figure No.
 7-1

Title
 Significant Wildlife Habitat
 6/19/2015

Prepared by GAC on 2015-06-18
 Reviewed by JYP on 2015-06-18
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Data Sources:
 1. Eagle Nests, Deer Wintering Area, Inland Waterfowl / Wading Bird Habitat: Maine Department of Inland Fisheries and Wildlife
 2. LUPC Deer Wintering Area: Land Use Planning Commission.
 3. USFW Atlantic Salmon Critical Habitat: US Fish and Wildlife.
 4. Base Map: USGS National Map base map web mapping service

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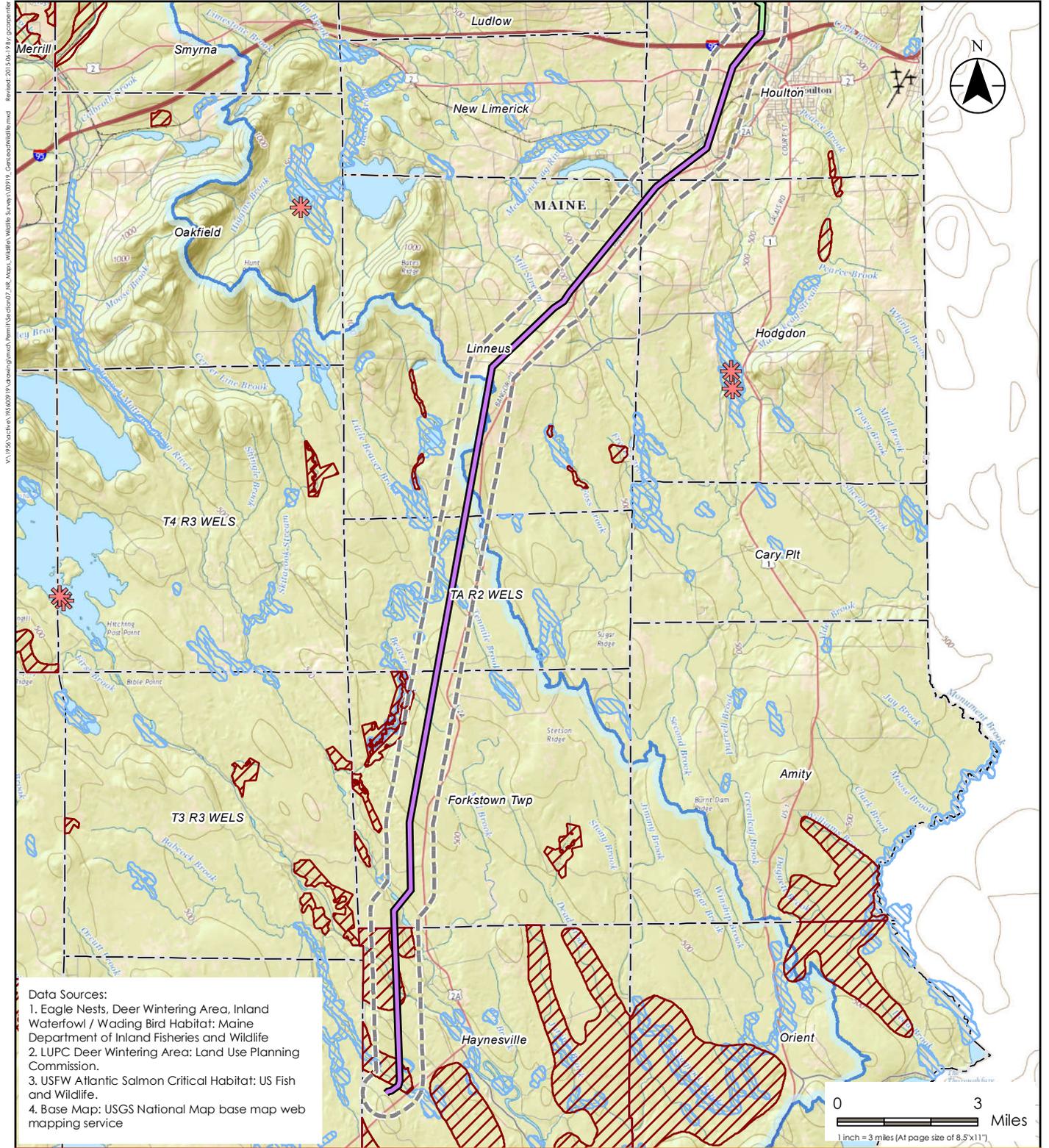
- Legend
- Mapped Eagle Nests (2013)
 - Bridal Path Generator Lead Line
 - North Generator Lead
 - 0.5 Miles from Generator Lead
 - MDIFW/LUPC Deer Wintering Area
 - MDIFW Inland Waterfowl / Wading Bird Habitat
 - USFW Atlantic Salmon Critical Habitat

Client/Project
 EDP Renewables North America LLC
 Number Nine Wind Farm
 Arostook County, Maine

Figure No.
 7-2

Title
 Significant Wildlife Habitat
 6/19/2015

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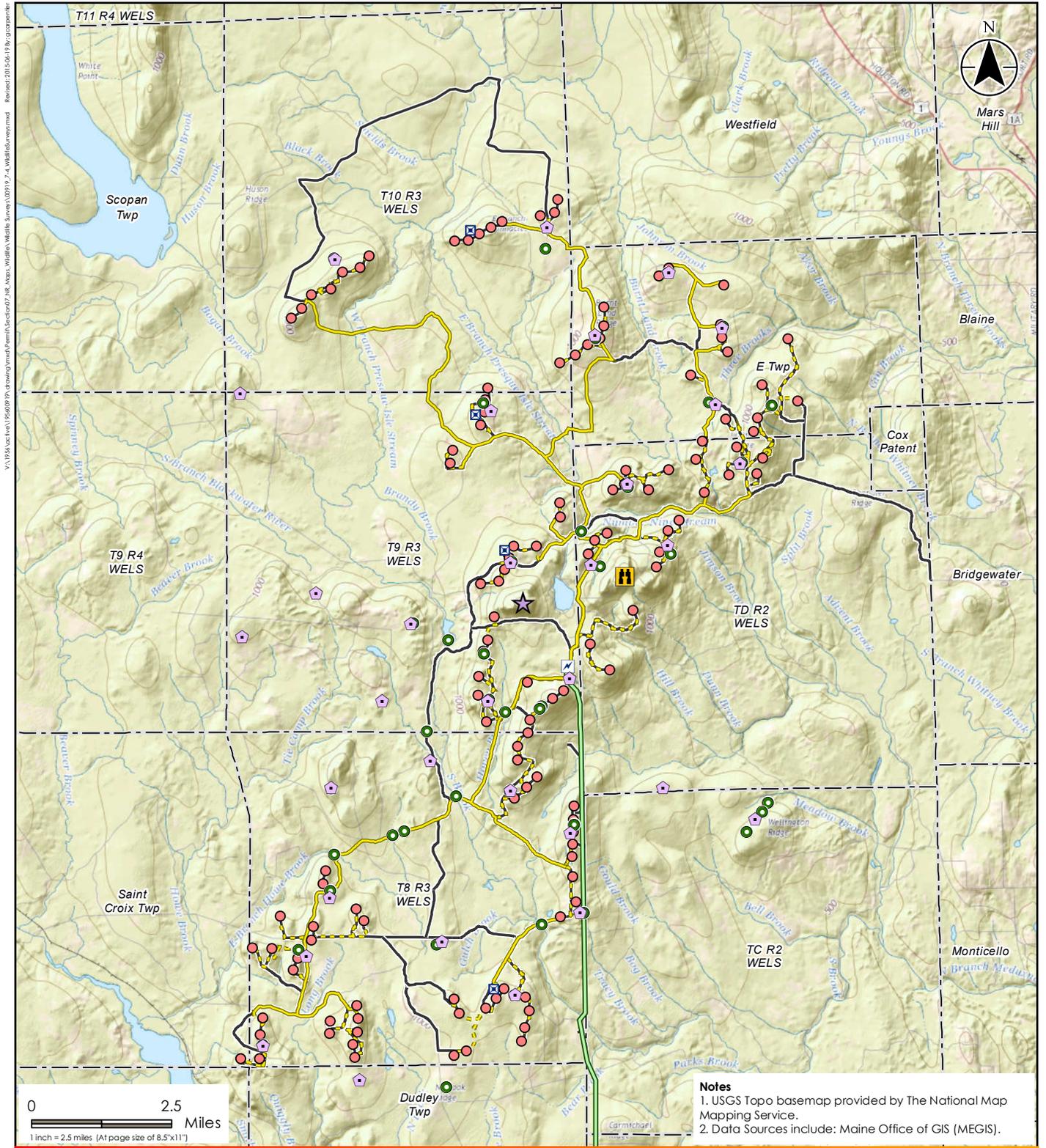
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Notes
 1. USGS Topo basemap provided by The National Map Mapping Service.
 2. Data Sources include: Maine Office of GIS (MEGIS).

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00919_7-4_WildlifeSurveys.mxd

Legend

- Turbines
- ⬢ Avian Use Survey Location
- Acoustic Bat Survey Location
- ⬢ Raptor Survey Location
- ★ Radar Survey Location
- ⬢ Permanent MET Tower
- ⬢ Substation/O&M Building
- North Generator Lead
- Overhead Collector
- - - Underground Collector
- Access Road

Client/Project

EDP Renewables North America LLC
 Number Nine Wind Farm
 Arostook County, Maine

Figure No.

7-4

Title

Wildlife Surveys

6/19/2015