Section 7
Wetlands, Wildlife, and Fisheries

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1.0 PROJECT DESCRIPTION

Maine GenLead, LLC (Maine GenLead) has proposed to construct an approximately 59-mile 115-kilovolt (kV) generator lead transmission line (project) extending from Bangor Hydro-Electric Company's existing Keene Road substation in Chester to a new substation servicing the Oakfield Wind Project in Oakfield. The original Oakfield Wind Project, DEP #L-24572-A-N and L-24572-TF-B-N (January 21, 2010) is being amended through a separate application to expand its generating capacity from 51 megawatts (MW) to 138 MW. Together, the summit and Maine GenLead amendments constitute the *Revised Oakfield Wind Project*. The purpose of the proposed 115-kV transmission line is to provide a direct interconnect between the energy generation in Oakfield and the Bangor Hydro-Electric and ISO New England transmission system to accommodate the increased energy output of the Oakfield Wind Project. The substation and 69-kV transmission line designed and permitted at the north end of the original Oakfield Wind project to connect to the Maine Public Service system would not be constructed.

The 115-kV design will be primarily single pole structures with double and triple poles and associated guying, as necessary, to support the integrity of the line. The amount of new clearing associated with the corridor would vary from 35 to 130 feet, depending on adjacency to existing infrastructure.

The 115-kV line would extend through 12 towns and townships---Chester, Woodville, Mattawamkeag, Molunkus Township, Macwahoc Plantation, North Yarmouth Academy Grant, Reed Plantation, Glenwood Plantation, T3R3 WELS, T4R3 WELS, Linneus, and Oakfield (Figure 1). The proposed transmission line would begin at the Keene Road Substation in Chester, where it would anchor to the existing power grid. Through Chester and Woodville, the new transmission line would be adjacent to the existing Line 56 transmission line corridor (ROW) for approximately 7 miles to an intersection with the existing 345-kV Maine Electric Power Company (MEPCO) corridor in Woodville. It then follows, with minor deviations, the MEPCO corridor northeast for approximately 33.8 miles to the Glenwood Plantation/Haynesville town line. From this point, the line runs north primarily along the westerly side of town boundaries for approximately 17.1 miles, to the town of Oakfield, then approximately 0.6 mile to a proposed substation located at the easterly string of wind turbines for the amended Oakfield Wind Project. In total, the proposed transmission line is adjacent to existing transmission corridors for 35.2 miles, 60 percent of its total length.

In advance of permitting activities for this project, Maine GenLead contracted Stantec Consulting (Stantec) to conduct wetland delineations, rare, threatened, and endangered (RTE) plant species surveys, and vernal pool surveys to characterize natural communities and, when possible, their wildlife species composition. Stantec also performed aerial surveys along the proposed project corridor to determine the use of the project by bald eagles (*Haliaeetus leucocephalus*), great blue heron (*Ardea herodias*), and osprey (*Pandion haliaetus*). These surveys provide data to help assess the potential risk to natural resources associated with the proposed project. The scope of these surveys was based on a combination of standard methods and is consistent with surveys conducted for other wind developments in Maine and throughout the Northeastern United States.

Construction of the proposed project is anticipated to affect local wildlife populations in various ways. Initially, the direct loss of habitat will result from the conversion of vegetated habitats to an open clearing for the ROW. Potential indirect effects could also include disturbance during and following construction of the project, which could result in short-term avoidance of the area by some species and targeted use of the project area by others, as well as the conversion of forested habitats to early successional habitats.

To the extent practicable, the project was designed to reduce impacts to local wildlife by avoiding and minimizing (to the extent practicable) any impact to regulated resources such as wetlands and Significant Wildlife Habitat, or other sensitive areas such as peatlands and high quality stream resources.

A review of available natural resource information in the area and ecological field investigations was conducted to characterize the habitats and wildlife use within the proposed project area. This information helps characterize the habitats present in the project area, identify predominant wildlife use, characterize some of the more critical resource concerns typically associated with wind energy developments, and address any site-specific concerns for the project.

Information used to characterize the existing wildlife communities and their habitats included consultation with state agencies and review of available wildlife habitat databases and published natural resource classification systems. Additionally, Stantec conducted site-specific field surveys in 2010 for activity of bald eagles, great blue heron, and osprey along the length of the project.

Stantec also consulted natural resource review agencies, including the Maine Department of Conservation Natural Areas Program (MNAP), the Maine Department of Inland Fisheries and Wildlife (MDIFW), the Maine Department of Environmental Protection (MDEP), and the U.S. Fish and Wildlife Service (USFWS).

Available databases of ecological resources and classification systems that were used during this characterization and assessment include Database of Essential Habitats and Sensitive Natural Areas, as categorized by the MDIFW (http://megisims.state.me.us); Land Use Regulation Commission Land Use Maps (http://www.state.me.us/doc/lurc); Natural Landscapes of Maine–the MNAP natural community classification system (Gawler and Cutko 2010); and Biophysical Regions of Maine (McMahon 1990).

The following sections outline the regional and local landscape setting, the dominant vegetation types and wildlife species, and the significant natural resources that occur in vicinity of the project area. In addition, potential impacts to natural resources and wildlife are discussed along with resource avoidance strategies and possible mitigation methods.

2.0 PROJECT AREA CONTEXT

The project is located within the Aroostook Hills Region and Aroostook Lowlands Region of Maine as originally described by McMahon (1990). The 15 biophysical regions described by McMahon (1990) were based upon areas demonstrating similar physiography, climate, surfical geology and soils, and plant species/communities. These 15 biophysical regions were consolidated for the Maine's Comprehensive Wildlife Conservation Strategy (MDIFW 2005) into eight ecoregions. Based upon this consolidation, the project is located within the Aroostook Hills and Lowlands Ecoregion. This ecoregion is an area of approximately 2.5 million acres characterized by calcareous soils and a predominance of bedrock in the hills, while deep loams provide the basis for a large agricultural land use in the lowlands. It represents the transition from temperate northern forests to the boreal spruce-fir forests that occur to the north and throughout Canada. The Aroostook Hills portion of the ecoregion is characterized by gently rolling hills with elevations averaging between 800 and 1,000 feet (McMahon 1990). The topography of the Aroostook Lowlands portion of the ecoregion is relatively low, with an average elevation between 600 and 800 feet with some isolated, higher monadnocks (bedrock hills). The Aroostook Lowlands area contains some of the most extensive calcareous formations in Maine. Aroostook Hills and Lowlands Ecoregion is sparsely populated when compared to southern Maine. Much of the land area is in commercial timber production with extensive agricultural land occurring in the Aroostook Lowlands. It contains the largest concentration of peatlands, marshes, and swamps in the state with mineral soils that are generally wet and dense with depressions filled with organic soils.

In general, the majority of the landscape surrounding the project area is a transition zone of two dominant land uses, agriculture and commercial timber management, which is characteristic of many townships in northern Maine. Specific to the project area, timber harvesting has occurred and continues to occur along most of the corridor, while there is very little active agriculture within the Project area. Both short and long-term forest management practices have influenced the existing natural communities. Most areas have been harvested several times within the last 75 years. No areas of completely undisturbed, old growth forest were observed. Several year-round residencies and seasonal camps are also located along existing paved and gravel roads that are crossed by the project corridor The proposed transmission line crosses eight municipal roads, including Pea Ridge Road, Route 116, Butterfield Ridge Road, Medway Road (State Route 157), Aroostook Road, Silver Ridge Road (U.S. Route 2), Dixie Road, and South Oakfield Road. Additionally, several unmaintained dirt and gravel roads cross the proposed transmission line, most of which are unnamed and privately owned.

The land cover surrounding the project area is predominantly hardwood forest, especially on upland ridges and hilltops. Areas of deciduous-coniferous mixed forest occur infrequently in lowlands and at lower elevations on the upland ridges. Significant portions of the region include freshwater wetlands dominated by aquatic bed habitat and peatlands. The major waterways in the area consist of Little Beaver Brook, Beaver Brook, East Branch of the Mattawamkeag River, West Branch of the Mattawamkeag River, Babcock Stream, Alder Brook, Battle Brook, Finn Brook, Wytopitlock Stream, Reed Pond, Macwahoc Stream, Arbo Brook, Molunkus Stream, Little Molunkus Stream, Martin Bog, Bog Brook, Mattaseunk Stream, Penobscot River, Eagle Stream, Blood Brook, Ebhorse Stream, Eighteen Bog, and Medunkeunk Stream. These waterbodies have a network of associated brooks, streams, and wetlands that ultimately feed the Penobscot River watershed.

The landscape associated with the project area is largely some version of the Spruce-Fir-Northern Hardwood Forest Ecosystem, typically upland hardwood or mixed wood forest and early successional forest. The MNAP returned a list of several rare and unique botanical features that occur within the project area, but no critically imperiled or imperiled natural communities occur within the project area. MNAP noted the presence of two landscape analysis sites intersected by the project. Additionally, there are several locations within the project that contain mapped Significant Wildlife Habitats. Wetlands along the project corridor are generally geographically and topographically concentrated. Many of these wetlands have experienced some level of anthropogenic influence throughout history, especially considering more than half of the wetlands abut an existing ROW. Several natural depressions or basins hold water seasonally, and some serve as breeding sites for vernal pool-associated species. The existing land cover types within the project area are described in more detail in the following pages.

Stantec completed a soil survey along the project area and found the soils to be primarily formed in glacial deposits, including glaciolacustrine and glaciomarine sediments, glaciofluvial deposits, alluvial or outwash deposits, decomposed organic matter. A detailed description of the soils within the project area is included in Section 11 of this application.

3.0 EXISTING VEGETATION TYPES

The project area is characterized primarily by Spruce-Fir-Northern Hardwood Forest Ecosystem. The existing land cover types influence the wildlife communities present in the project area. Climate conditions, geology, and past and recent land uses (i.e., forest harvesting and agriculture) affect the type and structure of available wildlife habitats. The project area consists of generally well-drained soils on flat to moderate slopes, mainly silty loams at higher elevations, with varying degrees of rocky and stoniness. The lower elevations consist of moderately to somewhat poorly drained silt loams or mucky organic matter and make up just under half of the soils along the project area. Wetland resources are distributed along the project area, but generally they are concentrated geographically and topographically. Most resources occur as large wetland complexes with streams in lowland areas. Many of the smaller wetlands that occur are in areas that have been influenced by past forest management activities. Conifer-dominated forests occur sporadically but are continuous when encountered. These occur largely in wetlands but also on steeper slopes.

The project layout was designed to avoid adverse impacts to natural resources to the greatest extent practicable. As such, the transmission line is proposed to be located adjacent to an existing utility ROW. This co-location should minimize forest fragmentation and the need for new access roads. Natural community features present within the study area include Spruce-Fir Forest, Spruce-Northern Hardwood Forest, Black Spruce Peatland, Northern White Cedar Swamp, Spruce-Fir Wet Flat, Upper Floodplain Hardwood Forest, Cobble Rivershore, Dwarf Shrub Bog, Tall Shrub Fen, Beech-Birch-Maple forest, Spruce-Northern Hardwood forest, Hardwood Seepage Forest and Red Maple Swamp. Following are descriptions of the natural communities that occur and could be potentially impacted by the project.

3.1. UPLAND HARDWOOD FOREST

Upland forested habitats within the project area largely fall within the Spruce-Fir-Northern Hardwoods Forest Ecosystem. This is a very common, widespread ecosystem throughout most of northern Maine (Gawler and Cutko 2010). A variety of forested natural communities can occur within this ecosystem as listed above in Section 3.0, but the Spruce-Northern Hardwoods Forest, Beech-Birch-Maple Forest, and Spruce-Fir Forest dominate the Project area.

Within the Spruce-Northern Hardwoods Forest, dominant tree species include red spruce (*Picea rubens*) and yellow birch (*Betula alleghaniensis*), often with a component of other hardwoods such as American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), or sugar maple (*Acer saccharinum*). Super canopy eastern white pine (*Pinus strobus*) trees are often present, but these are usually harvested during active forest management. The sapling and shrub layer is usually well developed, especially in areas that have undergone recent timber harvest. Species observed include striped maple (*Acer pensylvanicum*), hobblebush (*Viburnum lantanoides*), beaked hazelnut (*Corylus cornuta*), mountain maple (*Acer spicatum*), and saplings of canopy species. The herbaceous layer varies from sparse to dense depending on canopy closure, with the most commonly occurring species including blue bead lily (*Clintonia borealis*), Canada dwarf-dogwood (*Chamaepericlymenum canadense*), starflower (*Trientalis borealis*), Indian cucumber root (*Medeola virginiana*), northern wood sorrel (*Oxalis montana*), Christmas fern (*Polystichum acrosticoides*), red wakerobin (*Trillium erectum*), evergreen wood fern (*Dryopteris intermedia*), and wild sarsaparilla (*Aralia nudicaulis*). With historical timber harvest throughout the region, spruce was often selectively harvested out of the forest type, including along the project area. This leaves a canopy type that is dominated more by hardwood species, with spruce and fir dominating the understory that blends into the more conifer-dominated landscape.

Within the Beech-Birch-Maple Forest, common tree species include American beech, paper birch (*Betula papyrifera*), yellow birch, sugar maple, striped maple, and red maple. White ash (*Fraxinus americana*) and American linden (*Tilia americana*) are also locally common, and northern red oak (*Quercus rubra*) is an occasional component of the canopy. Canopy closure is variable in some areas and depends on the intensity of forest harvesting practices that have occurred in the last 5-10 years. If unaffected by harvesting, the canopy is often closed, resulting in a shaded forest floor with limited herbaceous and shrub development. Common species include Dutchman's breeches (*Dicentra cucullaria*), spring beauty (*Claytonia caroliniana*), round-leaved violet (*Viola rotundifolia*), drooping wood sedge (*Carex arctata*), oak fern (*Gymnocarpium dryopteris*), fibrous-rooted sedge (*Carex communis* var. *communis*), red wakerobin, and wild sarsaparilla.

The Spruce-Fir Forest describes part of the gradient of Spruce-Northern Hardwoods Forest when it is more heavily dominated by conifer species. This community typically has a closed canopy and a sparse herbaceous layer. Species composition is comparable to the previous community descriptions.

Areas with affected (i.e., open) tree canopies due to forest harvesting are found along the length of the project corridor, primarily in the eastern portions of the project area. These areas typically have a canopy closure of 60 percent or less, which is atypical of this hardwood forest community. Due to the openness of the canopy, the understory in these areas is more robust than other open canopy communities and includes shrub-sized saplings of the dominant tree species such as red maple, yellow birch, sugar maple, and American beech. Common hardwood forest understory shrubs include beaked hazelnut, striped maple, hobblebush, and highbush-cranberry (*Viburnum opulus* var. *americanum*), as well as open habitat species such as red raspberry (*Rubus idaeus*), blackberry (*Rubus allegheniensis*), and several goldenrod species, most commonly Canada goldenrod (*Solidago canadensis*).

A few areas along the Project corridor have recently had complete canopy removal and are characterized by early successional shrubs, saplings, and wildflowers. Species common to these areas include stump sprouts and saplings of pin cherry (*Prunus pensylvanica*), red maple, American beech, and yellow birch, as well as red raspberry, bristly blackberry (*Rubus hispidus*), whorled aster (*Oclemena acuminata*), Canada goldenrod, large sweet grass (*Anthoxanthum odoratum*), ox-eye daisy (*Leucanthemum vulgare*), and common wrinkle-leaved goldenrod (*Solidago rugosa*). In these areas, the understory species that

prefer a closed canopy appear to be under physiological stress with yellowing and withering leaves and distorted growth habits.

3.2. WETLANDS

Stantec completed a wetland and waterbody resource delineation in 2009 and 2010 (refer to Appendix 7-1). During this time, Stantec documented a number of emergent wetlands, wet meadows, bogs, fens, peatlands, streams, scrub-shrub wetlands, vernal pools, and forested wetlands (Cowardin *et. al* 1979). The project is designed to avoid and minimize impacts to those resources (see Table 7-1). Along the project area, Stantec identified the following:

- A total of 480 wetland resources along the proposed transmission line corridor;
- 47 jurisdictional streams, 6 of which have no adjacent wetland;
- 137 vernal pools of which 11 are Significant Vernal Pools; and
- 138 wetlands that meet criteria to be considered *Wetlands of Special Significance*.

As discussed in Appendix 7-1, the landscape surrounding the project area includes several wetlands that are identified as moderate and low quality Significant Wildlife Habitat. Generally, the adjacent landscape use consists of active forest management and residential-use properties.

Table 7-1. Wetland and Stream Impact Summary – Oakfield Wind Project

Wetland Impacts	Permanent fill (ac.)	Temporary fill (mats, ac.)	Vegetation clearing (ac.)	Stream impact--- culvert (lin. ft.)
Access roads	1.6	n/a	n/a	72
Transmission Line	0.1	23.7	133.4	n/a
TOTAL	**1.7 ac.**	**23.7 ac.**	**133.4 ac.**	**72 lin. ft.**

3.2.1. Forested Wetlands

Forested wetlands comprise slightly more than half of the on-site wetlands. Forested wetlands are those with more than 30 percent of their area dominated by woody vegetation that is greater than 3 inches in diameter and 20 feet in height. Canopy cover may consist of deciduous species, evergreen species, or a combination of the two. The on-site forested wetlands are characterized largely as Hardwood Seepage Forests and the Red Maple Sensitive Fern Swamp. These occur in low depressions and side slopes where groundwater discharges to the ground surface. Red maple is the dominant tree species, with yellow birch, black ash (*Fraxinus nigra*), and green ash (*Fraxinus pensylvanica*) also present. While the understory in these areas contains few shrubs, speckled alder and highbush cranberry occur in areas that are more open due to disturbance. Herbaceous species include sensitive fern, various sedges (*Carex gynandra, C. scabrata* and *C. vulpinoidea*), common woolsedge (*Scirpus cyperinus*), various grasses (*Glyceria melicaria, G. canadensis, and Calamagrostis canadensis*), and dwarf raspberry (*Rubus pubescens*). Eastern rough sedge is often dominant in the Hardwood Seepage Forest community. Soils in these wetlands vary from more than 16 inches of organic material (a histosol) to 3-12 inches of organic and/or a dark A horizon over a depleted matrix with redoximorphic features. Forested wetlands occur primarily at the lower topographic positions on the landscape and appear to have been undisturbed for several decades.

Some forested uplands have been more recently altered by timber harvesting resulting in tree removal, soil compaction, and the creation of open areas of standing or ponded water. These areas are most appropriately characterized as man-made wetlands. They are characterized by compacted soil from the action of heavy equipment, which has created an impermeable layer and intercepted the groundwater that, under natural conditions, occurs a foot or more below the ground surface. Trees present in these disturbed habitats include species typically associated with upland habitat such as quaking poplar, paper birch, and American beech, as well as species more typically associated with wetlands such as red maple and yellow birch. The sparse shrub layer includes species in the tree stratum, occurring as saplings, as

well as red raspberry, speckled alder, pussy willow (*Salix discolor*), long-beaked willow (*Salix bebbiana*), and bristly blackberry. Herbaceous species include sensitive fern, common wool-sedge, spotted-touch-me-not, common wrinkle-leaved goldenrod, common soft rush (*Juncus effusus*), and sedge species, typically fringed sedge and nodding sedge (*Carex gynandra*).

3.2.2. Scrub-Shrub Wetlands

Scrub-shrub wetlands comprise approximately 25 percent of the on-site wetlands. Scrub-shrub wetlands occur as either formerly forested wetlands that are reverting following timber harvesting or as naturally occurring shrub dominated communities such as Alder Shrub Thickets. Most of the on-site scrub-shrub wetlands are the former, made up of species such as speckled alder, white meadowsweet (*Spiraea alba* var. *latifolia*), yellow birch, gray birch (*Betula populifolia*), black ash, green ash, high-bush cranberry, northern white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), red osier dogwood (*Swida* [*Cornus*] *sericea*), long-beaked willow, high-bush blueberry (*Vaccinium corymbosum*), and pussy willow. The herbaceous layer is often lush and composed of sensitive fern, nodding sedge, fringed sedge, awl-fruited sedge, various grasses, Pennsylvania bitter-cress (*Cardamine pensylvanica*), Canada goldenrod, common wrinkle-leaved goldenrod, and cinnamon fern.

3.2.3. Emergent and Open Water Wetlands

Emergent wetlands make up approximately 25 percent of the on-site wetlands. These communities are often referred to as wet meadows and are represented in the project area by formerly forested wetlands that are in the very early stages of succession following timber harvesting or by meadows that developed above abandoned beaver (*Castor canadensis*) dams. In some cases, these emergent communities are part of larger wetland complexes containing other wetland types. An emergent wetland is defined as having more than 30 percent of its area dominated by herbaceous plants such as sedges, grasses, rushes, ferns and other forbs. Wet meadows are dominated by herbaceous species that are adapted to saturated soil conditions but are not adapted to long periods of inundations as would be common in marsh habitats. The on-site emergent wetlands typically contain cinnamon fern, common soft rush, common woolsedge, mosquito bulrush (*Scirpus hattorianus*), grass-leaved goldenrod (*Euthamia graminifolia*), northeastern manna grass (*Glyceria melicaria*), fowl manna grass (*Glyceria striata*), drooping sedge, fox sedge (*Carex vulpinoidea*), eastern rough sedge, necklace sedge (*Carex projecta*), fringed willow-herb (*Epilobium ciliatum*), water carpet, three-petaled bedstraw (*Galium triflorum*), and sensitive fern. Soils are moderately deep in these areas, with organic soil material over a depleted matrix with redoximorphic features. Some of these areas have been disturbed, and the emergent species are the first to be re-established.

Open water wetlands are a relatively small component of the wetlands along the project area. These are typically associated with beaver impoundments. The rare plant dwarf yellow water crowfoot (*Ranunculus gmelinii*) occurs in two of the open water wetlands that are part of a beaver-impounded, slow moving stream complex.

3.2.4. Streams

Stantec identified 47 MDEP-jurisdictional streams throughout the project area, including both perennial and intermittent streams. Intermittent streams typically flow for only part of the year, while perennial streams flow throughout the year in a typical year. The majority of the streams within the project area are associated with wetlands, with only a few having no adjacent wetland resources. The most common types of aquatic vegetation found within these stream channels are aquatic mosses (*Fontinalis sp*.), and in some instances, water carpet in the slower flowing sections of the channel. The most common aquatic wildlife observed in the stream channel was a variety of caddisfly species in the form of larval cases attached to the bottom of rocks. Black-fly and stone fly larvae were also observed under rocks, and small predatory fish were observed where there was sufficient water in the channel.

Many of the forested wetlands on-site contain MDEP-jurisdictional streams. These are generally lower perennial and intermittent streams. Plant species composition along these streams often includes

American beech, eastern hemlock (*Tsuga canadensis*), red maple, yellow birch, American elm (*Ulmus americana*), red spruce, and eastern hop-hornbeam (*Ostrya virginiana*). The shrub layer contains the same species present in the tree layer, as well as beaked hazelnut and speckled alder (*Alnus incana*). The herbaceous layer contains a wide variety of plant species, both upland and wetland plants, including water carpet (*Chrysosplenium americanum*), sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmunda cinnamomea*), oak fern, spotted touch-me-not (*Impatiens capensis*), and sedges (*Carex* sp.), most often fringed sedge (*Carex crinita*), nodding sedge (*Carex gynandra*), awl-fruited sedge (*Carex stipata* var. *stipata*), and eastern rough sedge (*Carex scabrata*). Eastern rough sedge in particular often forms extensive patches at the edges of streams and in adjacent wetlands. Stream sides within the project area that have greater amounts of alluvial deposition and/or associated calcareous substrates support silvery glade fern (*Deparia acrostichoides*), zig-zag goldenrod (*Solidago flexicaulis*), fiddlehead fern (*Matteuccia struthiopteris* ssp*. pensylvanica*), and occasional specimens of rattlesnake fern (*Botryichium virginianum*) and narrow triangle moonwort (*Botrychium angustisegmentum*).

3.2.5. Vernal Pools

Stantec conducted vernal pool surveys within the project area in May 2009 and 2010. Stantec identified a total of 137 vernal pools within the project area; 44 of the pools are natural, 11 of which are Significant Vernal Pools. The results of these surveys are provided in Appendix 7-1. These areas provide important breeding habitat for some amphibian and invertebrate species.

4.0 WILDLIFE USE OF THE OAKFIELD PROJECT AREA

The presence of wildlife species is associated with the type of land cover in a given area. Following are brief descriptions of the predominant wildlife species known or suspected to occur in the project area. A list of incidentally observed wildlife species (Appendix 7-2) was derived during extensive field surveys conducted along the proposed transmission line.

4.1. Significant or Sensitive Wildlife Habitats and Species

Significant or sensitive wildlife habitats are protected under state and/or federal law. As defined in Chapter 335 of the Natural Resources Protection Act, Significant Wildlife Habitat potentially present in the vicinity of the project area includes:[1]

- Habitat for state and federally listed endangered and threatened species;
- Mapped high and moderate value deer wintering areas (DWAs) and travel corridors;
- Mapped high and moderate value inland waterfowl and wading bird habitats (IWWHs), including nesting and feeding areas; and
- Significant Vernal Pools.

Stantec contacted natural resource agencies such as MDEP, MNAP, MDIFW, and USFWS to determine if there are any documented occurrences of RTE species or natural communities within or in the vicinity of the project area. Complete agency responses are presented in Appendix 7-3.

A response from MDEP stated that there are mapped wetland and streams in the project area, along with mapped IWWH. MDEP suggested that wetland and vernal pool surveys should be performed to more accurately map these resources. According to MDIFW, Significant Wildlife Habitats known to occur within the proposed project area include IWWH and DWAs. One DWA is located to the west of the project corridor in a wetland along the Skitacook Stream; however, the project does not intersect this resource. It is important to note that the response from MDIFW only included data for the towns of Oakfield, Island Falls and T4R3 within the project area. MDIFW did not comment on the remainder of the proposed project corridor. A response from USFWS indicated that portions of the project are located within the

[1] Based primarily on the project location and the results of the agency contacts, the project area will not impact Significant Wildlife Habitat located in coastal or tidal areas, such as shorebird habitat, seabird habitat, or mapped Tidal Waterfowl and Wading Bird Habitat. Only those habitats that are known to occur at inland locations were reviewed for this Project.

range of Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon (*Salmo salar*) and within the potential habitat of Canada lynx (*Lynx canadensis*), and that bald eagles may be present in the general project area.

Additional information about each of these resources is further discussed in the following sections.

4.1.1. Habitat for State Listed Species

Correspondence from MDIFW identified the occurrence of a rare mussel along the East Branch of the Mattawamkeag River. Three different species of rare mussel occur within five miles of the Project corridor, but correspondence is not clear as to what species was observed at this site along the East Branch of the Mattawamkeag River. Brook floater (*Alasmidonta varicosa*) and yellow lampmussel (*Lampsilis cariosa*) are both state-listed as threatened, and the creeper mussel (*Strophitus undulates*) is state-listed as a Species of Special Concern. These species inhabit flowing water habitat from small streams to large rivers. Stantec scientists visited the major river and stream crossings to survey for rare mussels, focusing on those waterbodies identified in the MNAP response. No rare mussels were observed within the project area, as the habitat at the crossings were not consistent with the habitat requirements for the rare species reported for those sites.

Stantec also completed an RTE species survey in the summer of 2010 at specific sites along the project area. Stantec identified four RTE species in wetlands along the proposed corridor. These species included showy lady's slipper (*Cypripedium reginae*), marsh valerian (*Valeriana uliginosa*), swamp fly-honeysuckle (*Lonicera oblongifolia*), and dwarf yellow water crowfoot. Further information about this survey can be found in Appendix 7-1 and Section 9 of this application.

On June 27, 2010, Stantec heard rusty blackbirds (*Euphagus carolinus*), which is state-listed as a Species of Special Concern, calling in wetland GLE354. The open water and scrub-shrub habitat that is preferred by this species occurs throughout the project area. Although it is possible that the rusty blackbird occurs elsewhere along the proposed transmission line, no additional incidental observations were made. Stantec also observed a wood turtle (*Glyptemys insculpta*), which is listed as a Species of Special Concern in Maine on Babcock Road. This wood turtle had been killed by a passing vehicle and no live wood turtles were observed in the project area. Other incidental observations of state-listed Species of Special Concern include blue-spotted salamander, bald eagle, veery, evening grosbeak, chestnut-sided warbler, black-and-white warbler, and white-throated sparrow. Stantec also observed a northern harrier (*Circus cyaneus*) in a wetland habitat during an aerial survey flight. Further information about these observations can be found in Section 9 of this application.

4.1.2. Habitat for Federally Listed Species

<u>Critical Habitat for Atlantic Salmon</u>
In 2009, Critical Habitat was designated for the freshwater geographic range occupied by the GOM DPS of Atlantic salmon, including all perennial stream, river, and lake habitats connected to the marine environment (50CFR226: Federal Register, June 19, 2009). The Project spans 6 different HUC-10 watersheds that are designated as critical habitat for salmon under the Endangered Species Act. The HUC-10 watersheds crossed by the project include the East Branch of the Mattawamkeag (#0102000302), West Branch of the Mattawamkeag River (#0102000301), 2 units of the Mattawamkeag River (#'s 0102000303 and 010200305), Penobscot River at Mattawamkeag (#0102000501), and Penobscot River at West Enfield (#0102000502). The Project layout includes 319,129 square feet of upland and wetland clearing for transmission line crossings of streams located within the area designated as critical habitat for salmon.

<u>Bald Eagle</u>
In 2009, the bald eagle was removed from Maine's list of species identified as state endangered or state threatened and designated as a Species of Special Concern. Although no longer listed by the federal Endangered Species Act, it is protected by the federal Bald and Golden Eagle Protection Act and the

Migratory Bird Treaty Act. Stantec conducted two aerial surveys focused in part on bald eagle nests in the project area in 2010. There are no bald eagle nests located within the proposed transmission line corridor. The full report is included as Appendix 7-4.

4.1.3. Deer Wintering Areas

The proposed transmission line will intersect portions of 5 mapped DWAs. These include DWAs mapped by the MDIFW, and shelter portions of DWAs designated as Fish and Wildlife Protection (P-FW) Subdistricts by the Maine Land Use Regulation Commission.

In 2009 and 2010, Stantec conducted DWA evaluations within portions of the 5 DWAs that might be affected by the proposed transmission line as well, as within 2 DWAs identified by MDIFW as part of a management agreement between Fraser Paper (Fraser) and the MDIFW. This survey effort included establishing transects within a 0.25-mile area associated with the proposed transmission line. Transect surveys were conducted during appropriate deer wintering conditions as outlined in the DWA and Travel Corridor MDIFW guidance document (December 22, 1993).

In 2010, where the proposed transmission line intersects an edge of a DWA or where the proposed transmission line parallels an existing transmission line corridor (e.g., MEPCO or Line 56 corridors), surveys were conducted within a 0.25-mile zone where landowner permission was granted. These surveys were intended to provide assessments of forest cover and habitat connectivity within the vicinity of the proposed transmission line. This approach was consistent with Stantec's 2009 survey effort. In areas where the proposed transmission line will intersect interior portions of the DWA (e.g., away from an existing transmission line corridor or away from the edge of the DWA), a more robust survey effort was conducted to characterize the existing forest cover and provide analyses of habitat connectivity within the DWA.

Three MDIFW mapped DWAs in Mattawamkeag, Woodville, and Chester are not presently functioning as DWAs. Past and ongoing timber management activities within these areas have substantially affected the ability of the areas to function as DWAs. Harvesting activities removed suitable softwood shelter stands and logging roads and skidder trails fragmented travel corridors.

Two DWAs in T3R3 WELS (North), have sporadic and limited conforming cover. In these three locations, the proposed transmission line is located along the periphery of the DWA or adjacent to the existing MEPCO corridor, minimizing fragmentation of the DWA. The DWA in T3R3 WELS (South), has conforming softwood cover that may be reduced by the proposed transmission line corridor. Only one plot in T3R3 WELS (south) had evidence of deer usage.

The Macwahoc Plantation, Glenwood Plantation and Reed Plantation (North and South) DWAs are part of the Fraser-MDIFW agreement DWAs. The Glenwood Plantation and Reed Plantation (South) plots have sporadic and limited conforming cover. The location of the proposed transmission line is such that fragmentation is already limited. The Macwahoc Plantation plots have conforming softwood cover that may be reduced by the proposed transmission line corridor. No plots in Reed Plantation (North) had evidence of deer usage. Plots in Macwahoc Plantation had the highest abundance of deer use and presently include suitable softwood stands that are being utilized by wintering deer. The establishment of a permanent treeless corridor through this area has the potential to fragment travel corridors and reduce the available softwood cover present within these DWAs. Appropriate mitigating measures like placing taller poles in the DWA to span a greater distance are in place, aiming to retain a more complete canopy.

The full report is included as Appendix 7-5.

4.1.4. Inland Waterfowl and Wading Bird Habitat

The landscape surrounding the project area includes several wetlands that have been designated by MDIFW as IWWH and were included in the MDEP agency response documents. Ten of the habitats intersect the project area (see Figure 2 for locations).

4.1.5. Significant Vernal Pools

Stantec identified 11 Significant Vernal Pools within the project area. Full descriptions of these pools are provided in Appendix 7-1.

4.2. BIRDS

Specific avian surveys along the project corridor included aerial surveys to assess use by bald eagles, osprey, and great blue herons. Incidental observations of birds were made during other natural resource surveys conducted within the project area. A variety of bird species are known or suspected to occur within the project area, including species common to northern hardwood forests and open upland shrub habitat. Bird species that often utilize upland hardwood forests and that were observed in the project area include black-capped chickadee (*Parus atricapillus*), blue jay (*Cyanocitta cristata*), golden-crowned kinglet (*Regulus satrapa*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*Picoides pubescens*), ruffed grouse (*Bonasa umbellus*), winter wren (*Troglodytes troglodytes*), hermit thrush (*Catharus guttatus*), red-eyed vireo (*Vireo olivaceus*), ovenbird (*Seiurus aurocapillus*), yellow-rumped warbler (*Dendroica coronata*), black-throated blue warbler (*D. caerulescens*), black-and-white warbler (*Mniotilta varia*), black-throated blue warbler (*Dendroica caerulescens*), barred owl (*Strix varia*), northern goshawk (*Accipiter gentilis*), broad-winged hawk (*Buteo platypterus*), and red-tailed hawk (*Buteo jamaicensis*). Many other species of songbirds may use the habitats presented though only during migration periods.

The segments of Spruce-Fir Forest distributed along the project area provide a variety of habitats for breeding songbirds, and some species may focus their use in those areas. Species that utilize this habitat and that were observed in the project area include northern parula (*Parula americana*), black-throated green warbler (*Dendroica virens*), ruby-crowned kinglet (*Regulus calendula*), and black-backed woodpecker (*Picoides arcticus*).

Open areas dominated by early successional habitats are suitable for a number of birds that nest or forage in these regenerating habitats. Common species that use this habitat and that were observed in the project area include northern flicker (*Colaptes auratus*), American robin (*Turdus migratorius*), chestnut-sided warbler (*Dendroica pensylvanica*), common yellowthroat (*Geothlypis trichas*), chipping sparrow (*Spizella passerine*), white-throated sparrow (*Zonotrichia albicolis*), dark-eyed junco (*Junco hyemalis*), veery (Catharus fuscescens), and rose-breasted grosbeak (*Pheucticus ludovicianus*). Red-tailed hawks regularly hunt from perches in this habitat.

Some wetland habitats throughout the project area may receive use by a subset of species that specialize in these habitats, including swamp sparrow (*Melospiza georgiana*), alder flycatcher (*Empidonax alnorum*), gray catbird (*Dumetella carolinensis*), northern waterthrush (*Seiurus noveboracensis*), or rusty blackbird (*Euphagus carolinus*). Ospreys were found nesting on the existing poles of the adjacent MEPCO transmission line. Stantec also observed a northern harrier in a wetland habitat during an aerial survey flight.

Stantec conducted aerial survey flights in the spring and summer of 2010. The aerial surveys were performed to identify bald eagle, great blue heron, and osprey nests and activity along the proposed transmission line. This survey started with reviewing the known nest locations in the vicinity of the project area as reported by MDIFW. The first aerial survey focused on locating any nests of these species in or adjacent to the proposed transmission line corridor. The second aerial survey focused on determining the occupancy and productivity of each bald eagle nest found during the initial survey. The results of the aerial nest surveys were provided in an e-mail memo report and maps from Stantec to Geoff West of First Wind on June 23, 2010 (Appendix 7-4).

4.3. MAMMALS

Mammals observed within the project area include white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*), coyote (*Canis latrans*), black bear (*Ursus americanus*), snowshoe hare, red squirrel (*Tamiasciurus hudsonicus*), gray squirrel (*Sciurus carolinensis*), and meadow voles (*Microtus pennsylvanicus*). Based upon available habitat, other species likely to be present in the project area include red fox (*Vulpes vulpes*), bobcat (*Lynx rufus*), marten (*Martes americana*), fisher (*Martes pennanti*), long-tailed weasel (*Mustela frenata*), raccoon (*Procyon lotor*), porcupine (*Erethizon dorsatum*), striped skunk (*Mephitis mephitis*), northern short-tailed shrew (*Blarina brevicauda*), eastern chipmunk (*Tamias striatus*), and southern red-backed vole (*Clethrionomys gapperi*).

4.4. AMPHIBIANS AND REPTILES

There is a predominance of upland mixed conifer and hardwood forest in the project area, which is non-breeding habitat for most amphibians. The nature of the canopy in these forests provides a mosaic of early spring sunlight, which creates microclimates across the landscape that may limit species distribution, especially in areas where more intense forest management has occurred. Amphibians observed within the project area include wood frog (*Lithobates sylvatica*), spotted salamander (*Ambystoma maculata*), blue-spotted salamander (*Ambystoma laterale*), green frog (*Lithobates clamitans*), and American toad (*Bufo americanus*). Some other species likely to be present based upon their known range and available habitats include the northern redback salamander (*Plethodon cinereus*), gray treefrog (*Hyla versicolor*), two-lined salamander (*Eurycea bislineata*), and spring peeper (*Pseudacris crucifer*).

The reptile community within the project area is likely represented predominantly by snakes. The species likely to be present include the redbelly snake (*Storeria occipitomaculata*) and ringneck snake (*Diadophis punctatus*), and scientists also observed the common garter snake (*Thamnophis sirtalis*). The open canopy in the adjacent open ROW and dense shrub development across much of the project area may provide suitable habitat for these species. Turtles are likely to occur within most of the project area in the large wetland complexes and vernal pools. Some species travel considerable distances during nesting. It is possible that some open areas at lower elevations in the project corridor, such as gravel roadsides, may be used as nesting habitat by snapping turtles (*Chelydra serpentina*). Painted turtles (*Chrysemys picta*) also likely inhabit the abundant wetland resources located throughout the corridor.

4.5. FISHERIES

The project area provides some fisheries habitat. The habitat types found within the project area are widely varied, from larger rivers such as the Penobscot and East and West Branches of the Mattawamkeag to small tributary streams that are not mapped on U.S. Geological Survey topographical maps. The MDIFW indicated the proposed route will not impact any inland Essential Fish Habitat but that the East Branch of the Mattawamkeag River supports a limited wild brook trout (*Salvelinus fontinalis*) population that is augmented by hatchery trout in the Oakfield area. The USFWS commented that the entire Penobscot River drainage is part of the Critical Habitat for Atlantic salmon. MDIFW encourages detailed road construction plans to protect surface water quality. Section 10 of this application details the specific buffer designs that will minimize impacts to stream resources.

4.5.1. Stream Crossings and Associated Fisheries

The proposed transmission line will cross the East and West Branches of the Mattawamkeag River and Penobscot River. The river crossing of the Penobscot will be co-located with an existing transmission line crossing near the Mattaseunk Dam. In total, there are 47 mapped rivers, streams, and stream segments that occur along the proposed transmission line (Appendix 7-1, Table A-2). Named streams crossed by the proposed transmission line include Medunkeunk Stream, Ebhorse Stream, Eagle Stream, Penobscot River, Mattaseunk Stream, Little Molunkus Stream, Molunkus Stream, Arbo Brook, Macwahoc Stream, Wytopitlock Stream, Smith Brook, Battle Brook, Babcock Stream, West Branch of the Mattawamkeag

River, East Branch of the Mattawamkeag River, and Beaver Brook.. Many of the additional streams present within the project area are unnamed tributaries of the above mentioned streams and rivers.

The streams within the proposed project area may support a variety of coldwater fishes. Coldwater species likely to be found in the project area are brook trout, stocked rainbow trout (*Oncorhynchus mykiss*), and stocked brown trout (*Salmo trutta*). Other species include redbelly dace (*Phoximus eos*), creek chub (*Semotilus atromaculatus*), finescale dace (*Phoximus neogaeus*), and shiner (*Nortropis spp.*). These coldwater fishes should not be significantly impacted by the proposed development.

4.5.2. Impacts and Effects on Streams and Associated Fisheries

The buffers that will be utilized to minimize impacts to fisheries resources are discussed in Section 10 of this application. Considering the extent of streams in the landscape area and the measures taken to protect the streams from pollutants and thermal increases, no adverse impacts to fisheries resources present along the corridor of the proposed transmission line are anticipated.

5.0 EFFECTS ON HABITATS AND ASSOCIATED WILDLIFE

Changes in cover type will occur throughout the project area when clearing is performed to allow for the construction and maintenance of the transmission line corridor, which will be allowed to revegetate as either grassland or low shrubs. In large part, access to the proposed transmission line will be accomplished using existing roads, with some temporary and permanent surface upgrades required. Approximately 35 miles of the proposed transmission line parallels existing ROW, where existing roads are already present. The northern 18 miles contain fewer existing access roads and will require more construction of new roads. In areas where no existing roads are present or use of existing roads is not practical, new road corridors will be cut and cleared. New road segments were designed to avoid impacts to wetlands, vernal pools, and streams where possible. For the most part, clearings will re-vegetate to conditions that resemble regenerating clearcuts and blowdowns, which are already common throughout the region. The impact of creating a transmission line corridor adjacent to an existing ROW is intended to reduce impact on wildlife as opposed to crossing an unfragmented landscape.

5.1. HABITAT LOSS AND DISTURBANCE

Clearing made for the Project area will re-vegetate to conditions that resemble the regenerating clearcuts and blowdowns that are already common throughout the region. In areas where the corridor deviates from the existing ROW, habitat fragmentation will be a primary impact to the landscape. An important aspect of habitat fragmentation is the separation of individual forest fragments from each other and from much larger forest reserves. This separation of larger forest blocks can affect wildlife that requires large, unbroken habitat block. Small, isolated pieces of forest do not provide the food and cover that many species of wildlife need for survival. In order to minimize the impact of habitat fragmentation, the proposed transmission line is collocated to the existing Line 56 and MEPCO Corridor where possible. Some amount of habitat fragmentation is expected where the proposed line will not be co-located with the ROW to avoid a resource impact or to accommodate landowner requests. Impacts will be similar to landscape changes that result from timber harvesting practices, which are common in the area. These areas are expected to become dominated by shrubs and a variety of herbaceous vegetation, as is typical of transmission lines. The re-establishment of shrub vegetation along the corridor will reduce the impact of the fragmentation, as animal species will still have a degree of cover to move between habitat blocks. Along the length of the project area, there is a network of camp and logging roads that have already fragmented the habitat.

The Spruce-Northern Hardwoods Forest, the predominant habitat along the project area, is common throughout the state. This habitat type is ranked as secure in Maine by MNAP, and there is no natural community type considered rare or sensitive along the project area. Unreasonable adverse impacts to wildlife communities due to loss of habitat are not expected. Wildlife populations in this area experience occasional rapid changes to habitats from timber harvesting activities. Throughout the project area, there

is potential for rare plants, and several of which have been identified. There is some risk of habitat loss for these species, although canopy openings may be beneficial for some species.

5.2. DIRECT IMPACTS TO WILDLIFE

The construction and maintenance of the electrical transmission line will result in a permanent change in cover type and habitat in the corridor and along new roads. The majority of the surrounding forest will remain in its present condition, and no further development is expected in the immediate vicinity beyond the current level of forest management activities. Terrestrial wildlife is not expected to be unreasonably affected by the maintenance activities once construction is complete. Transmission lines and poles can pose potential threats to birds; however, the corridor has been designed to Avian Protection Plan Guidance (APLIC and USFW 2005) standards to minimize these risks. Short-term disturbances will likely occur during construction.

Impacts to bald eagles are also expected to be minimal, as any crossings of major waterbodies for the project will be co-located with existing transmission line crossings. Where the proposed project is not adjacent to existing transmission line, no bald eagle activity was observed. Impacts to bald eagles are expected to be negligible.

5.2.1. Measures to Minimize Wildlife Impacts

During the initial planning stages of the project, the applicant evaluated specific project locations in order to minimize wetland and wildlife impacts. Multiple transmission line routes were initially investigated to determine their feasibility before any fieldwork began. This process was essential in finding the most practical route to pursue. Once fieldwork began, transmission line routes and turbine locations were continuously shifted to avoid newly found resources. The regular adjustment of the proposed corridor location illustrates that the applicant is dedicated to minimizing natural resource impacts to the extent possible while still factoring in cost, geography and existing land use. For additional information on the alternatives analysis, refer to Section 1A of this application.

6.0 CONCLUSION

The project includes approximately 59 miles of proposed transmission line corridor in Penobscot and Aroostook Counties, Maine, which will be primarily co-located with an existing ROW. This region of Maine has features typical of most areas in northern Maine: a sparsely populated residential community that is actively practicing agriculture and timber harvest activities. The development of the project will impact some wildlife habitat, but not at a level that would adversely affect their populations. Additionally, this project is not expected to diminish the natural communities present within the project area. This project has been designed to avoid and minimize wetland and other natural resource impacts to the greatest extent possible.

7.0 CITATIONS

(APLIC) The Edison Electrical Institute's Avian Power Line Interaction Committee (APLIC) and US Fish and Wildlife Service. 2005. Avian Protection Plan Guidelines.

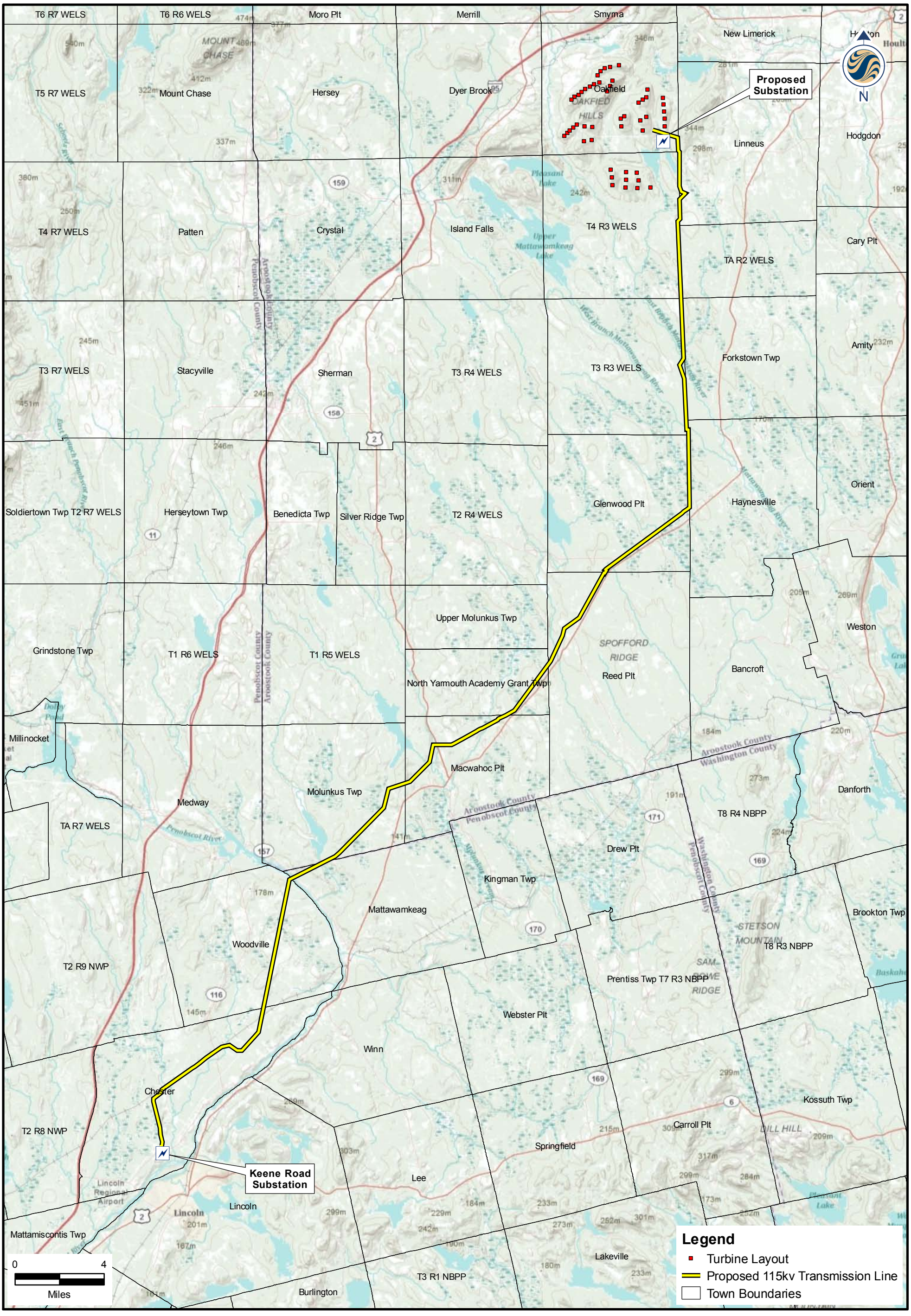
Cowardin, L., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Prepared for the U.S. Fish and Wildlife Service. December 1979.

Gawler, S.C. and A.R. Cutko, 2010. Natural Landscapes of Maine: A Guide to Vegetated Natural Communities and Ecosystems, Maine Natural Areas Program, Maine Department Of Conservation, Augusta, Maine.

McMahon, J.S. 1990. The Biophysical Regions of Maine – patterns in the landscape and vegetation. Orono, Maine. University of Maine MS Thesis (unpublished).

MDIFW. 2005. Maine's Comprehensive Wildlife Conservation Strategy. September 2005. Available at: http://www.maine.gov/ifw/wildlife/groups_programs/comprehensive_strategy/table_contents.htm.

Figure 1
Project Location Map



Prepared By:

Stantec

Project:

Revised Oakfield Wind Project
Penobscot and Aroostook Counties

Sheet Title:

Maine GenLead 115kV Generator
Lead Transmission Line Corridor

Date:	May 2011
Scale:	As Shown
Proj. No.:	195600518
Figure:	1

195600518-F001-Tline-11x17.mxd

Figure 2
Locations of Bald Eagle Nest Sites, Significant Wildlife Habitat, and Deer Wintering Areas

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00518-F002-TLineEagleSurveySpring2010.mxd

195600518

Client/Project
Maine GenLead, LLC
115kV Transmission Line
Aroostook and Penobscot Counties, Maine

Figure No.
2

Title
Oakfield Transmission Line Wetland Habitat Map

May 2011

Appendix 7-1
Wetland and Waterbody Resource Delineation and Vernal Pool Survey Report
Maine GenLead 115kV Transmission Line, July 2010

Appendix 7-2
List of Wildlife Species Observed within the Project Area

Common Name	Scientific Name
Mammal	
moose	*Alces alces*
black bear	*Ursus americanus*
coyote (scat, tracks)	*Canis latrans*
snowshoe hare	*Lepus americanus*
meadow vole	*Microtus pennsylcanicus*
white-tailed deer	*Odocoileus virginianus*
gray squirrel	*Sciurus carolinensis*
red squirrel	*Tamiasciurus hudsonicus*
Amphibian and Reptile	
blue-spotted salamander	*Ambystoma laterale*
spotted salamander	*Ambystoma maculatum*
American toad	*Bufo americanus*
wood turtle (carcass)	*Glyptemys insculpta*
bullfrog	*Lithobates catesbeiana*
green frog	*Lithobates clamitans*
wood frog	*Lithobates sylvatica*
common garter snake	*Thamnophis sirtalis*
Bird	
northern goshawk	*Accipiter gentilis*
sharp-shinned hawk	*Accipiter striatus*
ruby-throated hummingbird	*Archilochus colubris*
Canada goose	*Branta canadensis*
ruffed grouse	*Bonasa umbellus*
American bittern	*Botaurus lentiginosus*
red-tailed hawk	*Buteo jamaicensis*
broad-winged hawk	*Buteo platypterus*
American goldfinch	*Carduelis tristis*
turkey vulture	*Cathartes aura*
veery	*Catharus fuscescens*
hermit thrush	*Catharus guttatus*
evening grosbeak	*Coccothraustes vespertinus*
northern flicker	*Colaptes auratus*
American crow	*Corvus brachyrhynchos*
common raven	*Corvus corax*
blue jay	*Cyanicitta cristata*
black-throated blue warbler	*Dendroica caerulescens*
yellow-rumped warbler	*Dendroica coronata*
magnolia warbler	*Dendroica magnolia*
chestnut-sided warbler	*Dendroica pensylvanica*
yellow warbler	*Dendroica petechia*
black-throated green warbler	*Dendroica virens*
pileated woodpecker	*Dryocopus pileatus*
alder flycatcher	*Empidonax alnorum*
rusty blackbird	*Euphagus carolinus*
merlin	*Falco columbarius*
American kestrel	*Falco sparverius*
common yellowthroat	*Geothlypis trichas*

Common Name	Scientific Name
bald eagle	*Haliaeetus leucocephalus*
dark-eyed junco	*Junco hyemalis*
swamp sparrow	*Melospiza georgiana*
black-and-white warbler	*Mniotilta varia*
osprey	*Pandion haliaetus*
northern parula	*Parula americana*
rose-breasted grosbeak	*Pheucticus ludovicianus*
black-backed woodpecker	*Picoides arcticus*
pine grosbeak	*Pinicola enucleator*
downy woodpecker	*Picoides pubescens*
hairy wood-pecker	*Picoides villosus*
black-capped chickadee	*Poecile atricapillus*
ruby-crowned kinglet	*Regulus calendula*
golden-crowned kinglet	*Regulus satrapa*
American woodcock	*Scolopax minor*
ovenbird	*Seiurus aurocapillus*
yellow-bellied sapsucker	*Sphyrapicus varius*
chipping sparrow	*Spizella passerina*
barred owl (heard)	*Strix varia*
winter wren	*Troglodytes troglodytes*
American robin	*Turdus migratorius*
fly-catcher	*Tyrannidae*
white-eyed vireo (heard)	*Vireo griseus*
red-eyed vireo	*Vireo olivaceus*
white-throated sparrow	*Zonotrichia albicollis*
Insect	
water strider	*O: Hemiptera F: Gerridae*
predacious diving beetle	*O: Coleoptera F: Dytiscidae*
damsel fly	*O: Odonata S.O.: Zygoptera*
mosquito	*O: Diptera F: Culicidae*
black-fly (adult and larvae)	*O: Diptera F: Simuliidae*
deer fly	*O: Diptera F: Tabanidae*
Anthophylax cyaneus	*O: Coleoptera F: Cerambycidae*
Liogma nodicornis	*O: Endopterygota*
caddis fly larvae-leaf cases	*O: Trichoptera*
caddis fly larvae-sand cases	*O: Trichoptera*
whirlygig beetle	*O: Coleoptera F: Gyrindae*
fishfly	*O: Megaloptera F: Corydalidae*
stone fly	*O: Plecoptera F: Taeniopterygidae*

Appendix 7-3
Agency Correspondence

JOHN E. BALDACCI
GOVERNOR

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

ROLAND MARTIN
COMMISSIONER

March 29, 2010

PO Box 447
Ashland, ME 04732

Brooke E. Barnes
Stantec Consulting
30 Park Drive
Topsham, ME 04086

RE: Significant resources associated with Oakfield, Island Falls, and Dyer Brook and other areas, ME

Dear Mr. Barnes:

Please be advised that there are no known threatened, endangered or special status inland fish species or habitat within the proposed project area. Meduxnekeag Lake is managed for brown trout and splake through an annual stocking program. Wild populations of chain pickerel and white perch are present in the lake providing warmwater sport fisheries. Rainbow smelt are present and are significant forage species for these gamefish. Smelts utilize tributaries to the lake for spawning runs. The East Branch Mattawamkeag River supports a limited wild brook trout population that is supplemented with hatchery trout in the Oakfield and Smyrna area.

We would encourage great detail to road construction in accessing these areas for turbine installation and transmission lines to protect the surface water quality of surrounding lakes, rivers and brooks.

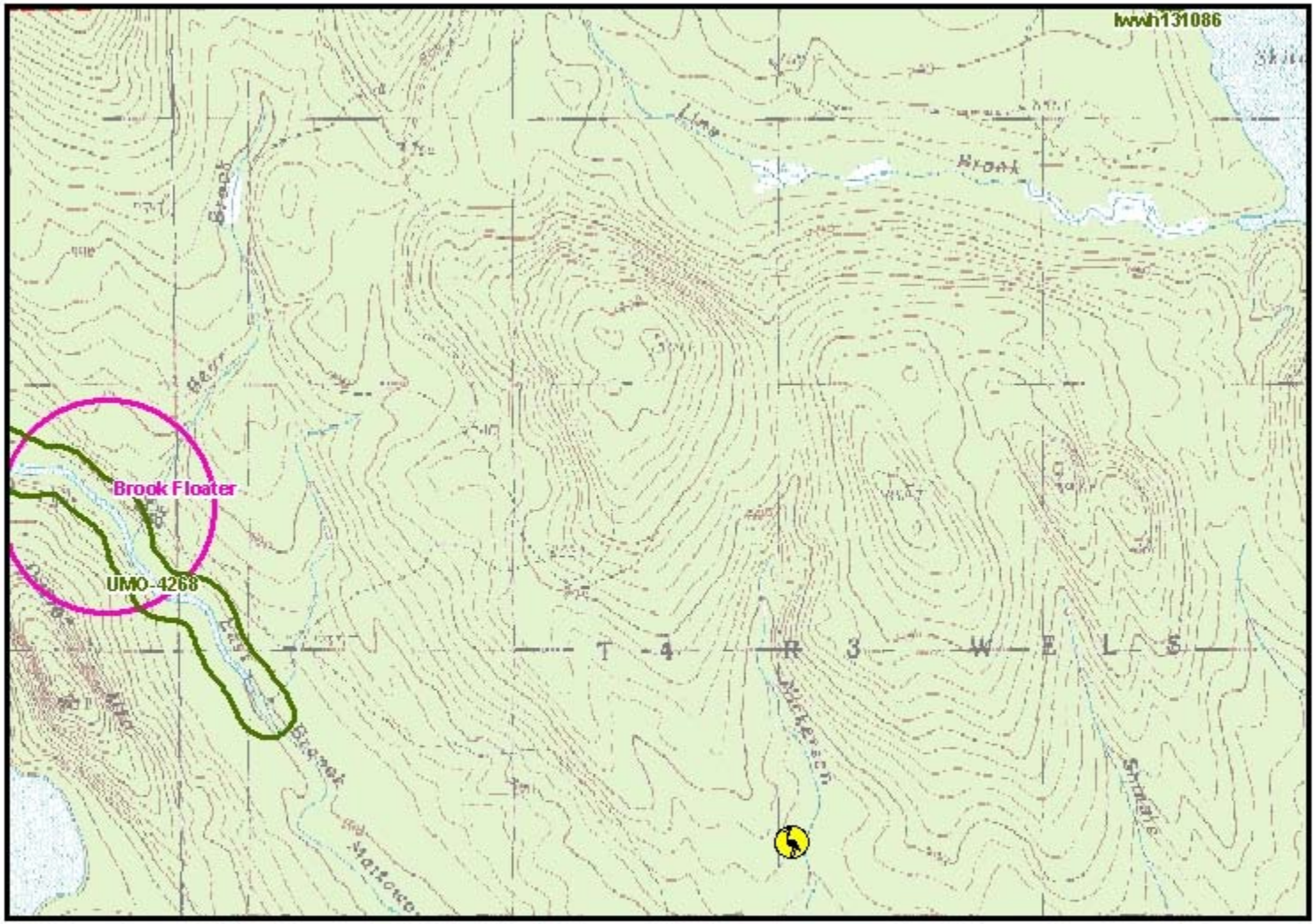
Thank you for the opportunity to review and comment on the fisheries resources in this proposed project area.

Sincerely,

David J. Basley

David J. Basley
Regional Fishery Biologist

Stantec-T4 R3 WELS



- Bald Eagle Nest Site
- Piping Plover / Least Tern Nesting, Feeding, & Brood-rearing Area
- Roseate Tern Nesting Area
- Deer Winter Area
- Inland Waterfowl / Wading Bird Habitat
- Tidal Waterfowl / Wading Bird Habitat
- Seabird Nesting Island
- Shorebird Area
- Significant Vernal Pool
- Endangered, Threatened, & Special Concern Species Habitat
- Township Boundary
- County

0 0.25 0.5 0.75 1 Miles

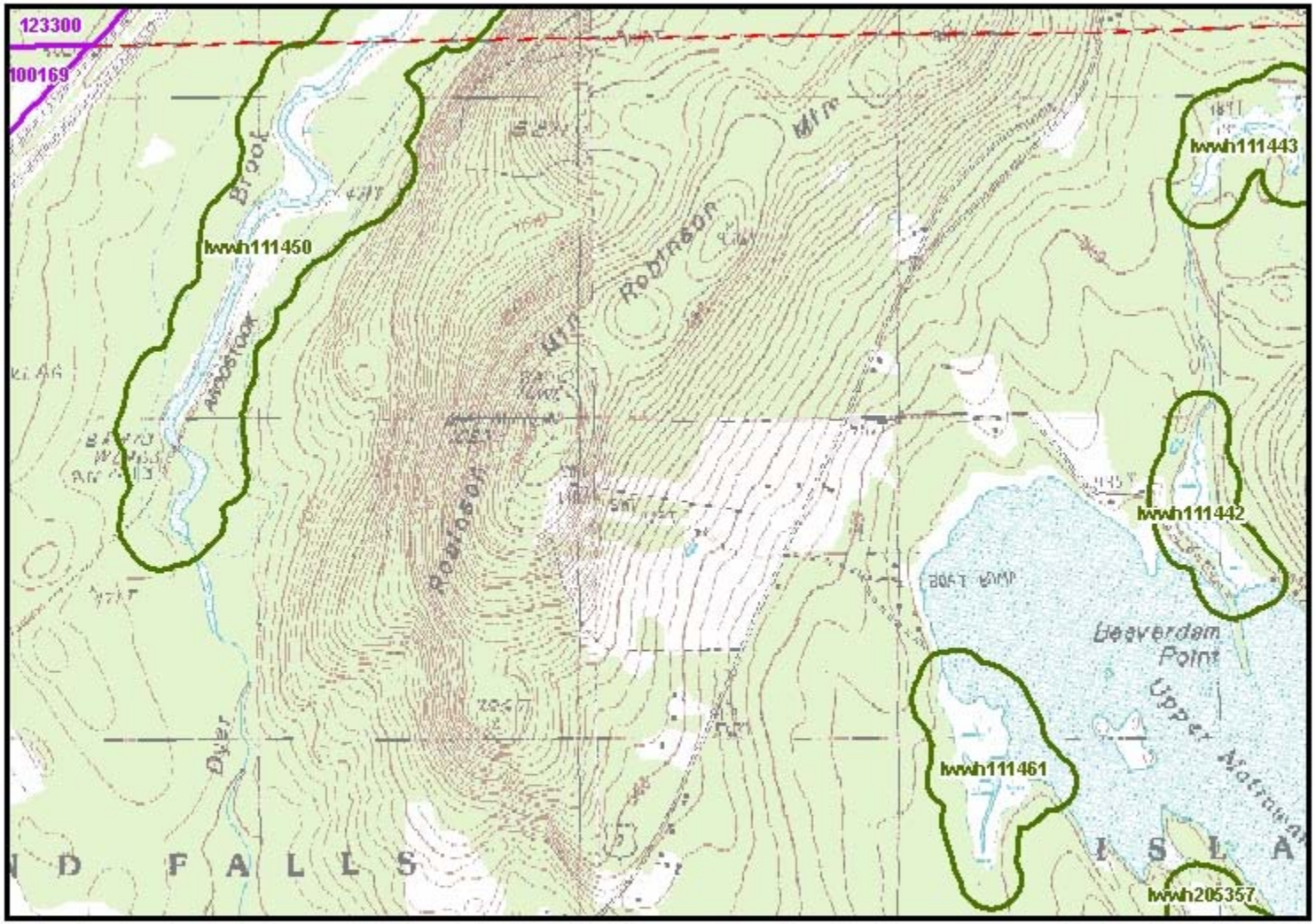
1 = 25,235

UTM Projection, Zone 19N, NAD83

N

73 Cobb Road
Enfield, ME 04493
Voice: (207) 732-4132
Fax: (207) 732-4405
March 11, 2010

Stantec-IF



- Bald Eagle Nest Site
- Piping Plover / Least Tern Nesting, Feeding, & Brood-rearing Area
- Roseate Tern Nesting Area
- Deer Winter Area
- Inland Waterfowl / Wading Bird Habitat
- Tidal Waterfowl / Wading Bird Habitat
- Seabird Nesting Island
- Shorebird Area
- Significant Vernal Pool
- Endangered, Threatened, & Special Concern Species Habitat
- Township Boundary
- County

0 0.2 0.4 0.6 0.8 Miles

1 = 20,937

UTM Projection, Zone 19N, NAD83

N

73 Cobb Road
Enfield, ME 04493
Voice: (207) 732-4132
Fax: (207) 732-4405
March 11, 2010

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Field Office – Ecological Services
17 Godfrey Drive, Suite #2
Orono, ME 04473
(207) 866-3344 Fax: (207) 866-3351

FWS/Region 5/ES/MEFO

March 15, 2010

Brooke E. Barnes
Stantec Consulting
30 Park Drive
Topsham, ME 04086

Dear Ms. Barnes:

Thank you for your letter dated March 1, 2010 requesting resource information from the U.S. Fish and Wildlife Service (Service) for proposed wind power facility sites in Oakfield, Island Falls and Dyer Brook, Maine, as well as appurtenant transmission line corridors. We recommend that you consult the Service's interim guidance on wind energy development at http://www.fws.gov/habitatconservation/wind.pdf. We used the Service's interim guidance as a model for developing *Guidelines for Building and Operating Wind Energy Facilities in Maine Compatible with Federal Fish and Wildlife Regulations*, which are attached to this letter. We stepped down the national interim guidance to make the guidance more relevant for Maine wind energy developers. We provide these guidelines so you can make an informed decision regarding site selection, project design, and address the requirements of federal fish and wildlife legislation.

This letter provides the Service's response pursuant to Section 7 of the Endangered Species Act (ESA), as amended (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250), and the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667d).

Project Name/Location: Oakfield, Island Falls & Dryer Brook wind facilities and transmission lines

Log Number: 53411-2010-SL-0133

Federally Listed Species

Atlantic salmon

This project occurs within the range of the Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon (*Salmo salar*) in Maine, a federally-endangered species under the joint

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jurisdiction of the Service and the National Marine Fisheries Service (NMFS) (74 FR 29344; June 19, 2009). The Atlantic salmon GOM DPS encompasses all naturally spawned and conservation hatchery populations of anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River and wherever these fish occur in the estuarine and marine environment. Also included in the GOM DPS are all associated conservation hatchery populations used to supplement these natural populations. Excluded are landlocked Atlantic salmon and those salmon raised in commercial hatcheries for aquaculture.

The proposed project site also occurs within a HUC-10 watershed (Mattawamkeag River 1&2, East Branch &West Branch Mattawamkeag, Penobscott River 2 at Mattawamkeag, and Penobscott River 1 at West Enfield) that has been designated as critical habitat for Atlantic salmon by NMFS (74 FR 29300; June 19, 2009). Critical habitat is designated to include all perennial rivers, streams, and estuaries and lakes connected to the marine environment within the designated watershed.

Please note that under Section 7 of the ESA, it is the federal action agency's responsibility to determine if a project may affect a federally listed species. For example, if the project receives federal funding or needs a federal permit, those actions may provide a "nexus" for Section 7 consultation under the ESA[1]. If the federal action agency determines that a project would have "no effect" on a listed species or critical habitat, they do not need to seek the concurrence of the Service and there is no need for Section 7 consultation. If the federal agency determines that a project "may affect" a listed species or its critical habitat, then consultation pursuant to Section 7 of the ESA should be initiated. Please note, however, that there is no provision under Section 7 for consultation after a project has already been completed.

For Atlantic salmon and its critical habitat, NMFS and the Service share consultation responsibilities under Section 7 of the ESA. The Service generally handles projects in the freshwater component of the salmon's habitat and NMFS handles projects in the marine and estuarine environment (generally below the head of tide).

Based on the information currently available to us, no other federally-listed species under the jurisdiction of the Service are known to occur in the project area.

Canada lynx

The federally-threatened Canada lynx (*Lynx canadensis*) occurs throughout northern Maine and could occur in your project area. The proposed sites are outside of the lynx critical habitat and just outside the area we normally review federal funded and permitted projects for lynx. We are not aware of lynx occurrences in or near the proposed sites. The proposed project site is not within the area designated as critical habitat for the Canada lynx (74 FR 8616; February 25, 2009), but lynx may occur on or near your project area. Federal agencies permitting or funding your project should consult with the Service according to Section 7 of the ESA.

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[1] Section 7 consultation, however, is only necessary when a federal agency takes a *discretionary* action (e.g., an agency has a choice of whether or not to fund or permit a particular project).

Canada lynx in Maine prefer to use regenerating spruce-fir habitats having high stem densities. These regenerating stands support high populations of snowshoe hare (*Lepus americanus*), the primary food of the Canada lynx. Highest hare densities are generally present about 12 to 30 years after clearcutting or heavy partial harvesting. Forest practices that diminish habitat quality for snowshoe hares may have an adverse affect on Canada lynx. We have developed *Canada lynx habitat management guidelines for Maine.* Please email (mark_mccollough@fws.gov) or call (207 866-3344 x115) if you are interested in obtaining a copy.

Wind power construction activities may cause adverse effects to the Canada lynx depending on the size and scale of habitat alteration a project may cause. Evaluations of boreal (spruce-fir) habitat and/or snow tracking surveys in the vicinity of proposed towers, roads, transmission lines, and other associated facilities would help assess the potential for the occurrence of lynx. Maine Inland Fisheries and Wildlife (MDIFW) conducted lynx snow track surveys in northern and western Maine in recent years. You should contact Jennifer Vashon, MDIFW lynx biologist (650 State Street, Bangor, ME 04401) to determine if surveys were conducted in your project area or nearby townships. Ultimately, this information will be needed by federal agencies permitting or funding your project to determine if adverse effects to lynx or critical habitat are anticipated. We ask that you share this information with the Service and federal permitting or funding agencies (Army Corps of Engineers or others) who are required to consult with the Service according to Section 7 of the ESA. We encourage project designs that will avoid and minimize adverse effects to lynx and their habitat.

Other Protected Species

Occasional, transient bald eagles may occur in the general project area. The bald eagle was removed from the federal threatened list on August 9, 2007 and is now protected from take under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. "Take" means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. The term "disturb" under the Bald and Golden Eagle Protection Act was recently defined within a final rule published in the Federal Register on June 5, 2007 (72 Fed. Reg. 31332). "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

Further information on bald eagle delisting and their protection can be found at http://www.fws.gov/migratorybirds/baldeagle.htm.

Please consult with our new national bald eagle guidelines, which can found at http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf. These Guidelines are voluntary and were prepared to help landowners, land managers and others meet the intent of the Eagle Act and avoid disturbing bald eagles. If you believe this project will result in taking or disturbing bald or golden eagles, please contact our office for further guidance. We encourage early and frequent consultations to avoid take of eagles.

We have not reviewed this project for state-threatened and endangered wildlife, wildlife species of special concern, and significant wildlife habitats protected under the Maine Natural Resources Protection Act. We recommend that you contact the Maine Department of Inland Fisheries and Wildlife:

Steve Timpano
Maine Department of Inland Fisheries and Wildlife
284 State St.
State House Station 41
Augusta, ME 04333-0041
Phone: 207 287-5258

We also recommend that you contact the Maine Natural Areas Program for additional information on state-threatened and endangered plant species, plant species of special concern, and rare natural communities:

Lisa St. Hilaire
Maine Natural Areas Program
Department of Conservation
93 State House Station
Augusta, ME 04333
Phone: 207 287-8046

If you have any questions about this project, please contact Mark McCollough (Canada lynx and bald eagles) at (207) 866-3344 x115 or Wende Mahaney (wetlands and Atlantic salmon) at (207) 866-3344 x118.

Sincerely,

Lori H. Nordstrom

Lori H. Nordstrom
Field Supervisor

Enclosure :

- NOVEMBER 2009 USFWS WIND ENERGY GUIDELINES
- FEBRUARY 11, 2010 CANADA LYNX GUIDELINES

Appendix to Maine Field Office wind development guidelines

Canada lynx February 11, 2010

The federally-threatened Canada lynx occurs throughout northern Maine and could occur in or near your project area. Federal agencies funding or permitting wind projects are required to consult with Service according to Section 7 of the Endangered Species Act. Project effects on lynx must be addressed if your project occurs within the area depicted in Map 1. Within critical habitat (Map 2) federal agencies must ensure projects will not result in adverse modification of habitat. We recommend the following:

Pre-application

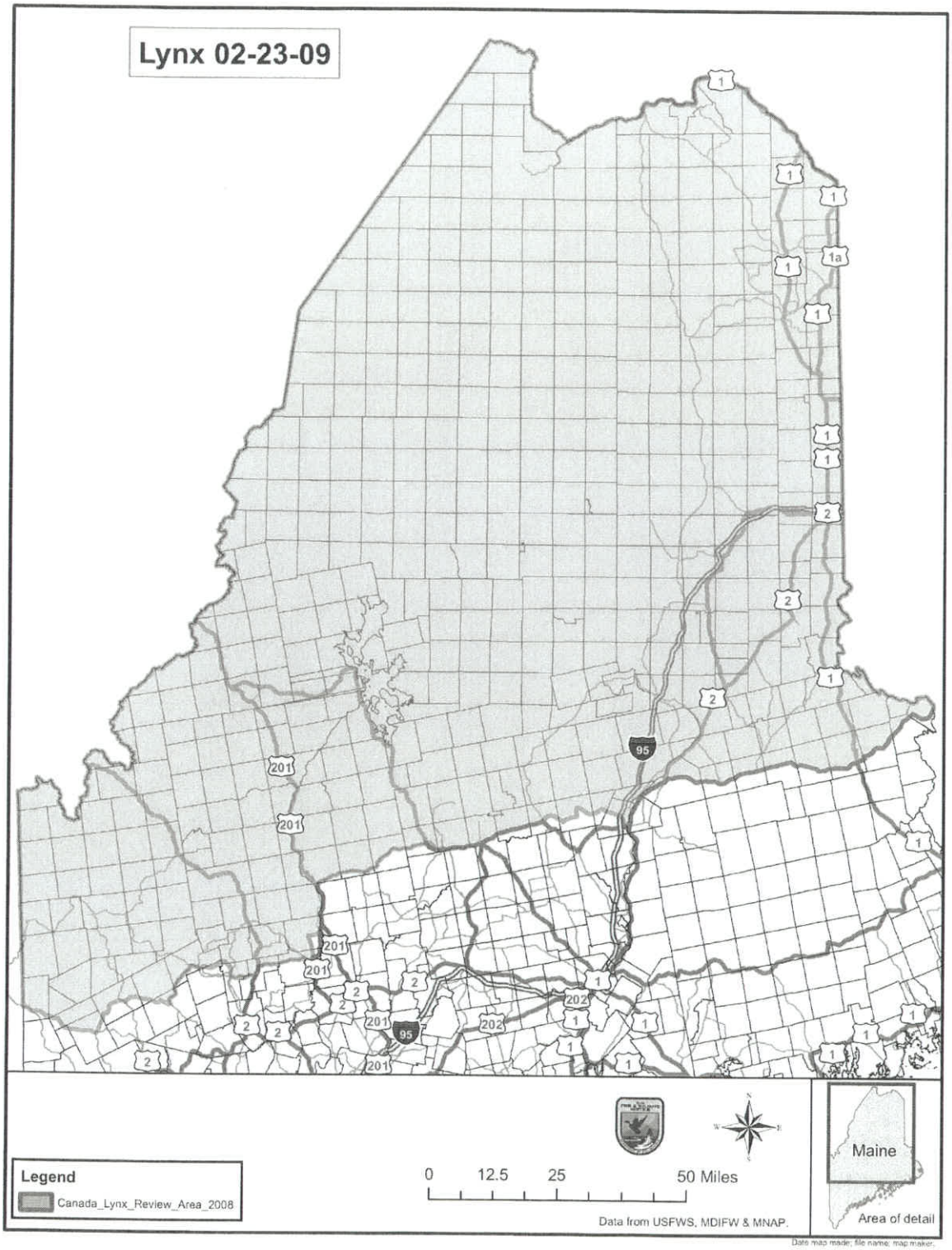
1. **Avoid adverse effects to lynx and their habitat** - A landscape analysis should be conducted to identify areas suitable for wind development that will not fragment or adversely affect current and future habitat of Canada lynx. University of Maine lynx and snowshoe hare habitat models (e.g. Hoving 2002, Robinson 2006, Simons, 2009, Scott 2009) and Maine Inland Fisheries and Wildlife lynx occurrence data are suggested sources of information. Project developers are encouraged to consult with the Service when locating potential sites.
2. **Contact the Service and permitting agency early and often -** Once a site is selected for potential development (prior to placement of met towers) wind developers and their consultants should contact our office requesting information on federally-listed species in the area. It is important that projects be identified as potential wind energy projects so that we provide the best scientific information and guidance.
3. **Document lynx occurrence -** We recommend at least three preconstruction winter snow tracking surveys for Canada lynx be conducted in the township(s) where turbines, roads, transmission lines, and other associated facilities are proposed. Surveys should follow MDIFW lynx snow tracking protocol. If surveys are not conducted, Canada lynx will be assumed to be present at high densities. Study design of snow track surveys should be discussed with the Service.
4. **Document lynx habitat –** Current and future lynx habitat should be identified and mapped in the vicinity of the project footprint and surrounding landscape. Canada lynx in Maine prefer to use regenerating spruce-fir habitats having high stem densities. These regenerating stands support high populations of snowshoe hare, the primary food of the Canada lynx. Highest hare densities are generally present about 12 to 30 years after clearcutting or heavy partial harvesting. Sources of information necessary to map habitat include landowner stand maps (regenerating softwood and softwood dominated stands, mature softwood (future habitat)), aerial photo interpretation, and satellite imagery (Simons 2009, Scott 2009). Habitat mapping methods should be discussed with the Service.
5. **Evaluate risk to lynx and their habitat -** Characterize habitat present in the project area in relation to surrounding landscape. Review literature of lynx movements in relation to wind projects or similar development. Is project construction likely and operation likely to displace lynx from their habitat? At a minimum, wind developers should document

total project footprint, acres of lynx habitat within the project footprint, miles of new road, and miles of new road in lynx habitat. Fragmentation of large blocks of lynx habitat should be documented. Anticipated traffic volumes and speed (construction and post-construction) should be documented. Direct, indirect, and cumulative effects on lynx should be analyzed (including disturbance effects on lynx).

6. **Avoid and minimize effects to lynx.** The Service will consult with federal agencies funding, implementing, or permitting wind projects. Projects that are likely to adversely affect or take lynx will require formal consultation and a biological opinion, which may require up to 130 days after all materials have been submitted. Projects that avoid adverse effects will require informal consultation, which can be completed in a much shorter period of time. Through informal or formal consultation, the Service will make recommendations to federal permitting or funding agencies that may further avoid or minimize effects to Canada lynx and their habitat. These recommendations may become permit conditions. Avoidance measures may include gating new roads to avoid introducing new sources of lynx mortality, revegetating disturbed areas and maintain young forest habitat to create snowshoe hare habitat, and limiting speeds of vehicles to reduce likelihood of vehicle mortality. In some instances, mitigation may be warranted to compensate for adverse effects to Canada lynx and their habitat.
7. **Restore habitat -** A vegetation management plan for restoring and maintaining turbine pads, roadsides, and transmission line corridors should be prepared. A habitat restoration plan for the conclusion of the project should be prepared.

Post-construction

1. **Document lynx response to wind projects.** In some instances post-construction snow tracking surveys should be conducted to document lynx distribution and habitat use after the wind project is operational (compare to pre-construction baseline studies). Extent and duration of surveys should be discussed with the Service. Radio-telemetry studies and other research techniques may be warranted to document lynx movements and habitat use in relation to wind development.
2. **Adaptive management –** To date, the Service is unaware of scientific studies of the direct and indirect effects of wind on Canada lynx (or any land mammal). We encourage the wind industry to work with the Service to document response of land mammals (particularly Canada lynx) to wind projects and locate and share published and unpublished reports. An adaptive management plan, including long-term monitoring, may be warranted to address uncertainty.


Lynx 02-23-09
Legend
Canada_Lynx_Review_Area_2008
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Data from USFWS, MDIFW & MNAP.
Maine
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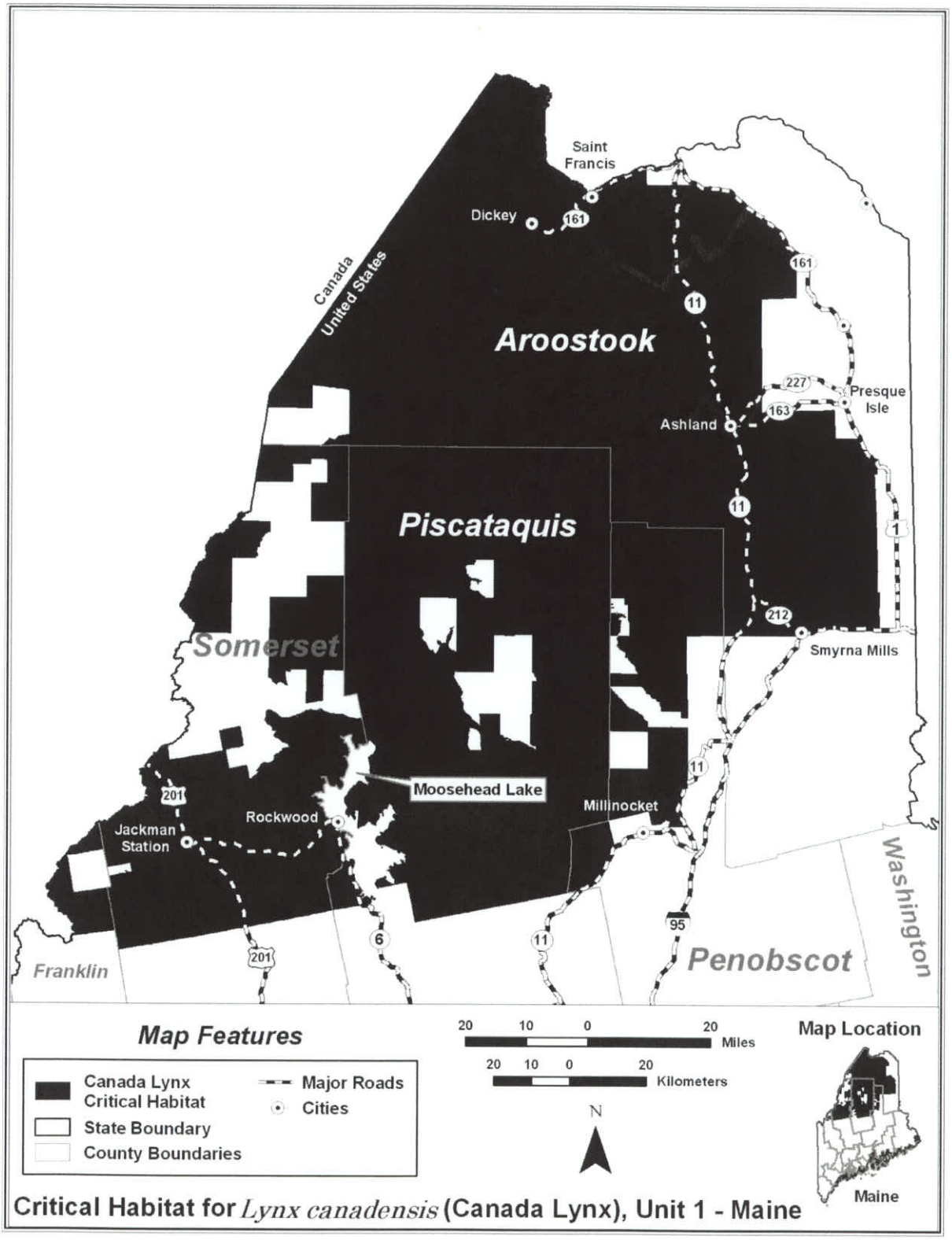

Critical Habitat for *Lynx canadensis* (Canada Lynx), Unit 1 - Maine

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Field Office – Ecological Services
17 Godfrey Drive, Suite #2
Orono, ME 04473
Phone: (207) 866-3344 Fax: (207) 866-3351

Guidelines for Building and Operating Wind Energy Facilities in Maine Compatible with Federal Fish and Wildlife Regulations

Developed by the Maine Field Office, U. S. Fish and Wildlife Service
November, 2009

Background: Wind energy is renewable, produces no emissions, and can be an environmentally friendly technology. Development of wind energy is endorsed by the Secretary of the Interior. However, wind energy facilities can adversely affect fish and wildlife and their habitats. The Service's mission is conservation of fish and wildlife in the public trust. Our goals are to ensure renewable energy is fish, wildlife and habitat friendly and to make informed decisions and recommendations based on sound environmental assessment. Project review and permitting will be expedited when projects avoid, minimize, and mitigate adverse effects to federal trust resources.

Proper siting of turbines continues to be our most critical concern related to wind energy development - both to avoid and minimize wildlife mortality and habitat fragmentation. As more facilities are built, the cumulative effects of this rapidly growing industry may initiate or contribute to the decline of some wildlife populations. The potential harm to these populations from an additional source of mortality makes careful evaluation of the siting and effects of proposed facilities essential.

The Service is currently participating on a Federal Advisory Committee to develop national guidelines for site selection, evaluation, construction, and operation of wind energy facilities across the country. These new guidelines will be posted on the Service's national wind energy web page (http://www.fws.gov/habitatconservation/wind.html). Until new guidelines are prepared, wind energy developers and their consultants should consult the Service's *Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines* (2003) are available at the same website.

Purpose: We provide these guidelines so you can make an informed decision regarding site selection, project design, and address the requirements of federal fish and wildlife legislation. These guidelines also provide information on Service wind energy guidance documents and wildlife species that we consider during the formal consultation process for construction projects. We hope this information assists you during your initial pre-site considerations and project design and encourage you to consult with us early in your wind energy development process. The project review and permitting process will proceed more quickly if projects avoid, minimize, and mitigate adverse effects to federal trust resources. We used the Service's interim guidance

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as a model for developing the guidance that follows, but stepped them down to make the guidance more relevant for Maine wind energy developers.

Legal authorities: This guidance advises you of federal wildlife laws applying to wind power, including the Endangered Species Act as amended (16 U.S.C. 1531-1543), Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250), and Migratory Bird Treaty Act (16 U.S.C. 703-712).

Endangered Species Act (ESA): Under Section 7 of the ESA federal agencies that permit or fund wind energy projects must determine if a project may affect federally listed species. If the federal agency determines that a project has "no effect" on a listed species or their critical habitat, they do not need to seek the concurrence of the Service. If the federal agency determines that a project is "not likely to adversely affect" a listed species, the agency must explain the basis for their determination and seek the written concurrence of the Service. Projects that have an "adverse effect" on a listed species require formal Section 7 consultation with the Service.

Unauthorized take of federally-listed species is prohibited under Section 9 of the ESA. If take of a listed species is anticipated, wind developers are encouraged to contact the Service to discuss obtaining an incidental take permit under Section 10 of the ESA, which involves developing a Habitat Conservation Plan.

Several federally listed species could be affected by wind power projects in Maine. The federally-threatened Canada lynx occur throughout northern Maine. Critical habitat was designated in March 2009 in northwestern Maine. The endangered Atlantic salmon Gulf of Maine Distinct Population Segment encompasses all naturally spawned and conservation hatchery populations of anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River and wherever these fish occur in the estuarine and marine environment. Critical habitat was designated throughout much of this area in June 2009. The federally threatened piping plover and roseate tern nest along the coast of Maine. Other federally-listed species occur in Maine and could occur in your project area.

Bald and Golden Eagle Protection Act (BGEPA): Although the bald eagle has recovered such that it no longer is protected under the ESA (August 9, 2007), it remains protected from take under the Bald and Golden Eagle Protection Act (BGEPA)(16 U.S.C. 668-668d) and the Migratory Bird Treaty Act (16 U.S.C. 703-712). "Take" means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. The term "disturb" under the BGEPA means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior (72 FR 31332, June 5, 2007). It is the responsibility of landowners and project proponents to determine whether their project will take or disturb eagles. A permit is necessary to avoid potential liability for take.

The U.S. Fish and Wildlife Service prepared National Bald Eagle Management Guidelines (http://www.fws.gov/migratorybirds/CurrentBirdIssues/NationalBaldEagleManagementGuidelines.pdf) to help landowners, land managers and others meet the intent of BGEPA and avoid disturbing bald eagles. Please note that our National Bald Eagle Guidelines do not provide guidance for large development projects like wind power projects.

The Service published a final rule explaining policies and procedures for applying for incidental take permits under the BGEPA (FR 74 46836-46879), which became effective on November 10, 2009. Draft *Implementation Guidance for Eagle Take Permits* will soon be distributed for public notice and comment and will provide further details on application requirements and procedures. The Service will soon release new national *Draft U. S. Fish and Wildlife Service Raptor Conservation Measures* for public notice and comment, which will specifically address lethal infrastructure projects such as wind power. The measures will also provide the interim guidance for golden eagle disturbance until species-specific guidance can be developed.

With extensive habitat and over 500 nesting pairs of bald eagles in Maine, nesting, migrating, wintering, summering, and transient bald eagles occur throughout the state. Maine was the last state to support nesting golden eagles in the eastern U. S. (up to 1999), and a small (100+ pairs), but growing population nests immediately north in Quebec and Labrador. Golden eagles nest in the Gaspe region of Quebec, have been seen in Maine in recent years during the breeding season, and may reoccupy Maine in the future.

Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA): The MBTA prohibits the taking of migratory birds, their eggs, parts, and nests. While the MBTA has no provision for allowing an unauthorized take, we recognize that some birds may be killed at structures such as wind turbines even if all reasonable measures to avoid take are implemented. We encourage wind power proponents to utilize the Service's wind energy guidelines, complete appropriate pre- and post-construction studies, and to site and operate wind projects to avoid and minimize take of migratory birds.

Bats: There are no federal regulations protecting bats, however, the Service encourages you to incorporate measures to avoid and minimize risk to bats. The federally endangered Indiana bat is not known to occur in Maine.

Some wind energy projects have been especially injurious to bats. Foremost, the potential exists for death to bats from collision or "barotraumas" (low pressure damage to lungs) within the rotor-swept area of wind turbines. The potential for mortality of bats is affected by many factors but location of the wind turbines seems to be one of the most important. The potential for harm makes careful evaluation of wind facilities essential.

Wetlands: Your project will likely require bridging, filling, or degrading certain wetlands or other waters of the United States under jurisdiction of section 404 of the Clean Water Act, which may require permits be acquired from the U.S. Army Corps of Engineers. The Corps of Engineers requires project proponents to avoid, minimize, and mitigate wetland impacts, and the Service strongly supports this sequential approach to permitting. The federal "nexus" of wetland

permitting by the Army Corps may require ESA consultation. The Service may provide recommendations to the Army Corps to avoid and minimize effects to fish and wildlife in issuing Clean Water Act permits.

Organization: The following guidelines provide Maine wind project developers with methods to assess potential effects, design, and operate a wildlife-friendly wind facility. We have organized these steps into three stages of wind facility development:

Stage 1: Site evaluation and selection
Stage 2: Project design and construction
Stage 3: Facility operation, monitoring, and adaptive management.

Each proposed wind power development site is unique and requires detailed, individual evaluation. We encourage wind energy proponents to develop site evaluation and pre- and post-construction surveys simultaneously with the Service, Maine Department of Inland Fisheries and Wildlife (MDIFW), and appropriate state and federal agencies. Site evaluations are important to select appropriate areas for wind development where adverse effects to wildlife and habitats can be avoided or minimized. Preconstruction surveys may allow for the project to be designed in such a way to further avoid or minimize impacts. As with all development projects, we encourage wind developers to consult early and consult often with our field office to minimize impacts to fish and wildlife. Doing so will facilitate permit review and result in compliance with federal legislation.

Stage 1: Site Evaluation and Selection

The first step in the assessing potential wind power sites is to conduct a regional evaluation of possible project locations to avoid adverse effects to fish and wildlife resources, wetlands, and sensitive ecosystems. Large project developers of all kinds typically conduct a regional evaluation of potential sites using information in the public domain and contacts with the Service, MDIFW, Maine Natural Areas Program, and other agencies. Wind developers are encouraged to use the site evaluation protocol in Appendix 1 of the *Service's Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines*. Information should be evaluated on federal and state-listed species and their critical habitats; bald and golden eagles; migration corridors for birds, bats, and other wildlife; characterization of wildlife habitats present including wetlands; and proximity to state or national parks or wildlife refuges. If state and federal agencies lack data on these natural resources, project proponents are encouraged to seek help in designing studies to secure this information. The purpose of this reconnaissance is to identify and exclude sites with special designation and/or particularly high risks to fish and wildlife, identify sites that may be promising for wind power, and ultimately select a site that meets the wind developer's requirements while avoiding and minimizing impacts to fish and wildlife.

Stage 2: Project Design and Construction

After an appropriate wind development site is selected where impacts to fish and wildlife remain a concern, attention should be given to avoiding and minimizing impacts to fish and wildlife

through careful project design. If endangered species are present, consultation should begin with federal permitting agencies and the Service.

The following recommendations for wind energy development in Maine are intended to assist developers who are in the planning and design process. These recommendations will further avoid and minimize adverse effects to wildlife and their habitats and may evolve over time as new federal guidelines are developed and additional experience, monitoring and research, and adaptive management practices document how best to avoid and minimize impacts to wildlife. The Service will work with developers, the State, and other stakeholders to evaluate, revise, and update these recommendations. If necessary, additional recommendations may be made to address site-specific concerns.

Recommendations for addressing wildlife concerns in the development of wind energy projects in Maine.

1. When sites are being considered for potential wind power development (prior to placement of met towers) we encourage developers and their consultants to promptly contact our office to request information on federal trust species in the area. It is important that you identify your project as a potential wind energy project so that we can provide you with the best information and recommendations. The Service recommends development and agency review of pre-construction study plans that describe proposed assessments for endangered species, bald and golden eagle, migratory bird, wetland and other natural resources of concern.

2. To address the Endangered Species Act we will likely require surveys and/or habitat assessments for federally-listed species. These evaluations will be used by the federal agency authorizing, implementing, or funding the project to complete their evaluation of effects on listed species. If there is no federal connection to the project this information can be used to identify whether there is a risk of incidental take such that an incidental take permit may be necessary. Survey design may vary between sites in extent, methodology, and duration according to species and site. Survey designs should be developed with the Service to assure proper methods are being used and to determine where to focus additional investigations. Pre-construction surveys, whether in progress or completed, do not imply the Service's sanction for development of a site.

3. To address the Bald and Golden Eagle Protection Act we recommend surveys begin at least two years in advance of anticipated project construction to identify important eagle feeding, roosting, nesting or wintering areas eagle areas within four miles of your project area. Four miles is an average distance that Maine bald eagles may be expected to travel within their nesting territory or from roosting, foraging, or wintering areas.

   If important eagle areas are identified by MDIFW or the Service or discovered via surveys, we recommend two years of pre-construction studies be completed to obtain baseline information on eagle nest productivity, document use of feeding, roosting, nesting or wintering areas, documenting movements in relation to proposed turbine locations (including an analysis of spatial use in relation to rotor swept zone), numbers

moving through the project area, movements in relation to meteorological conditions, and phenology of movements. For proposed wind projects located within four miles of eagle nests, we recommend that eagle movement studies be conducted for two years for at least 20 days each nesting season when adult eagles and their fledged young are most active (June through early October). Migrating eagle information should be collected as part of raptor migration surveys (see recommendation #4).

The purpose of surveys is to document the use and location of important eagle areas in relation to the proposed infrastructure, document eagle use of the project area, and ensure proper siting and placement of infrastructure to avoid take of eagles. For example, wind turbines sited between several bald eagle territories and a river that serves as the eagle's primary feeding area will have a higher risk of mortalities than it would if sited outside of the flight path of the eagles.

Eagle migration and movement data should be used to develop a quantitative risk assessment to determine likelihood of take of bald and golden eagles. If the risk assessment suggests that incidental take of eagles is likely, developers should employ measures to avoid take of eagles. Developers are advised to seek a BGEPA incidental take permit from the Service if take or disturbance cannot be avoided. Under a BGEPA permit, developers will likely be requested to conduct long-term post-construction studies of behavioral response to wind turbines, and monitoring of mortality, injury, and productivity so that the effects of the wind project on eagles can be monitored and understood. Additionally, an adaptive management plan likely will be required to regularly review and analyze eagle data, meet with the Service to discuss results, and develop appropriate measures to further reduce take of eagles. Mitigation for take may be necessary.

If the risk assessment suggests that take of eagles is not likely, but important eagle feeding, roosting, nesting or wintering areas are nearby or migratory eagles frequent the area, then long-term monitoring would be advised to periodically reassess risk to eagles under BGEPA.

4. To address Migratory Bird Treaty Act and bat concerns, we concur with recommendations for migratory bird and bat surveys found in MDIFW and Maine Department of Environmental Protection (MDEP) *Methodologies for Evaluating Bird and Bat Interactions with Wind Turbines in Maine*, Attachment H (http://www.maine.gov/doc/mfs/windpower/pubs/report/wind_power_task_force_rpt_final_021408.pdf).

   Bird and bat survey information will be used by the Service to evaluate and comment on overall site suitability, siting of turbines and other infrastructure, habitat fragmentation, and risk to birds and bats. In addition survey data may be used to inform permit review with other agencies, permit conditions, design and duration of post-construction studies, and adaptive management programs.

5. We encourage wind developers and their consultants to review and incorporate the Service's *Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines* (2003)(http://www.fws.gov/habitatconservation/wind.pdf) This document

provide robust data on environmental impacts that are comparable between the pre- and post-construction condition. Wind energy proponents should develop the post-construction study plan simultaneously with the Service and MDIFW. By doing so, federal and state regulatory agencies and the developer have a reasonable expectation of the operational measures to be employed if significant bird and bat mortality occurs. Examples of additional measures may include habitat manipulation and management on and around the project site, radar monitoring coinciding with migration, and discontinuing turbine operation during high risk conditions.

2. Post-construction mortality studies for birds and bats should be conducted for 2 to 3 years (both spring and fall migration seasons) within 5 years of initiating operation of a wind project. These studies should follow the MDIFW-DEP *Methodologies for Evaluating Bird and Bat Interactions with Wind Turbines in Maine*. Developers should consult with the Service and MDIFW when varying from recommended methodologies. Adaptive management, as described in the post-construction plan, should be employed to revise methodologies as new information is obtained.

3. Take of endangered species and bald and golden eagles should be reported to the Service within 24 hours of discovery. Migratory bird and bat mortality events of >25 individuals over a 24-hour period should be reported to the Service within 24 hours of discovery. Otherwise, bird and bat mortalities should be summarized in reports provided to the Maine Field Office at least annually.

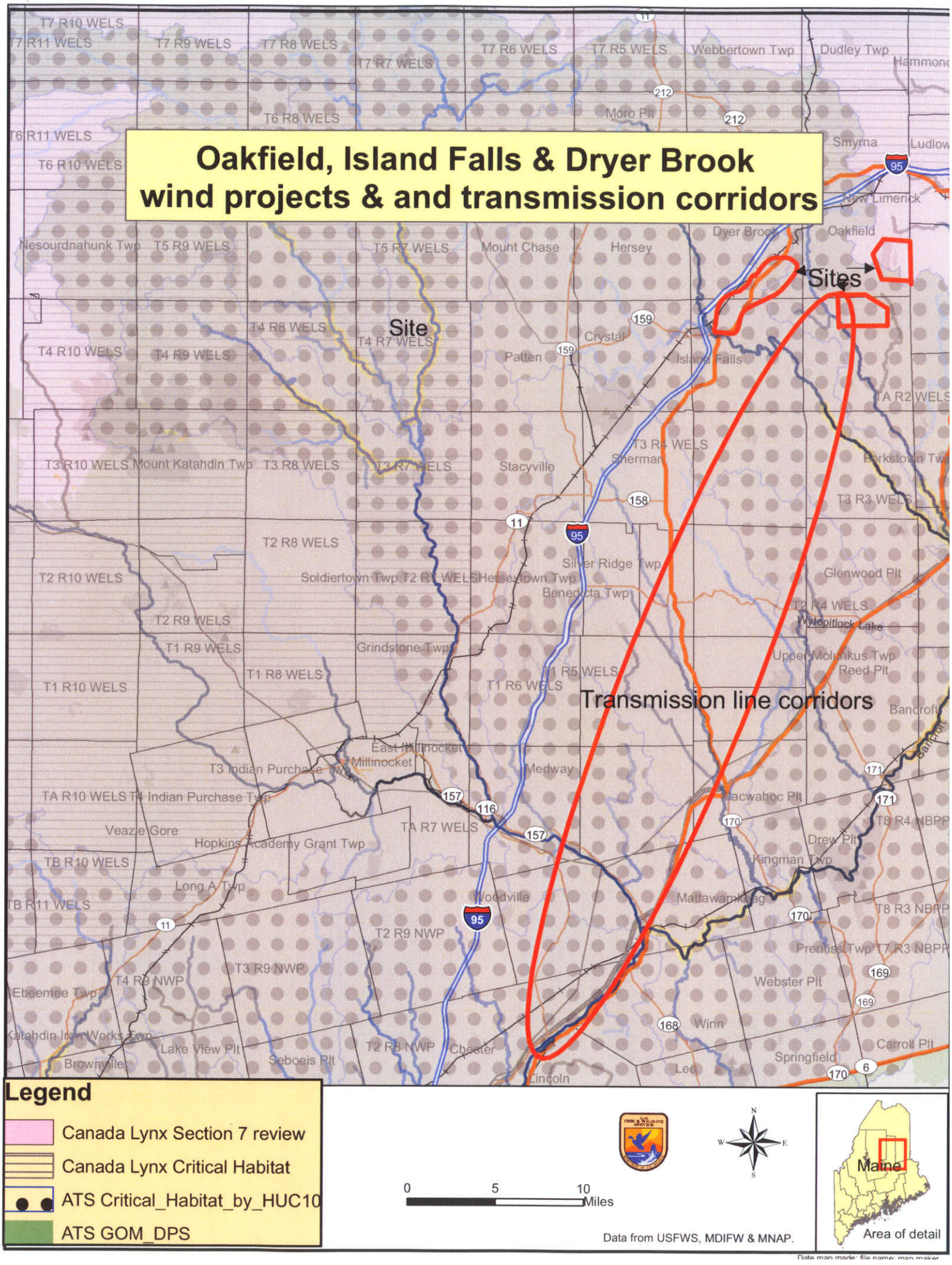
In summary, the guidelines provided above and the Service's *Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines* (2003) are intended to guide wind power developers in Maine while protecting federal trust fish, wildlife and their habitats.

If you have any questions, please call or email:

Lori Nordstrom, Project Leader at (207) 866-3344 x111, lori_nordstrom@fws.gov

Mark McCollough, endangered species biologist (Canada lynx, Furbish's lousewort, roseate terns, piping plovers, and bald eagles) at (207) 866-3344 x115 mark_mccollough@fws.gov

Wende Mahaney, wetland and endangered species biologist (Atlantic salmon) at 866-3344 x118, wende_mahaney@fws.gov


Oakfield, Island Falls & Dryer Brook
wind projects & and transmission corridors
Sites
Site
Transmission line corridors
T7 R10 WELS
T7 R11 WELS
T7 R9 WELS
T7 R8 WELS
T7 R7 WELS
T7 R6 WELS
T7 R5 WELS
Webbertown Twp
Dudley Twp
Hammond
T6 R8 WELS
Moro Plt
T6 R11 WELS
T6 R10 WELS
Smyrna
Ludlow
New Limerick
Nesourdnahunk Twp
T5 R9 WELS
T5 R7 WELS
Mount Chase
Hersey
Dyer Brook
Oakfield
T4 R8 WELS
T4 R7 WELS
T4 R10 WELS
T4 R9 WELS
Crystal
Patten
Island Falls
TA R2 WELS
T3 R4 WELS
Sherman
T3 R10 WELS
Mount Katahdin Twp
T3 R8 WELS
T3 R7 WELS
Stacyville
Forkstown Twp
T3 R3 WELS
T2 R8 WELS
Silver Ridge Twp
T2 R10 WELS
Soldiertown Twp
T2 R5 WELS
Heresetown Twp
Benedicta Twp
Glenwood Plt
T2 R4 WELS
Wildpitlock Lake
T2 R9 WELS
T1 R9 WELS
Grindstone Twp
Upper Molunkus Twp
Reed Plt
T1 R8 WELS
T1 R5 WELS
T1 R6 WELS
T1 R10 WELS
Bancroft
East Millinocket
Millinocket
T3 Indian Purchase Twp
Medway
Bangor
TA R10 WELS
T4 Indian Purchase Twp
Macwahoc Plt
T8 R4 NBPP
Veazie Gore
TA R7 WELS
Hopkins Academy Grant Twp
Drew Plt
TB R10 WELS
Kingman Twp
Long A Twp
TB R11 WELS
Woodville
Mattawamkeag
T8 R3 NBPP
T2 R9 NWP
Prentiss Twp
T7 R3 NBPP
T3 R9 NWP
T4 R9 NWP
Webster Plt
Ebeemee Twp
Katahdin Iron Works Twp
Winn
Lake View Plt
T2 R8 NWP
Chester
Carroll Plt
Brownville
Seboeis Plt
Springfield
Lee
Lincoln
Legend
Canada Lynx Section 7 review
Canada Lynx Critical Habitat
ATS Critical_Habitat_by_HUC10
ATS GOM_DPS
0
5
10
Miles
Data from USFWS, MDIFW & MNAP.
Maine
Area of detail

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

March 10, 2010

Brooke E. Barnes, Project Manager
Stantec Consulting
30 Park Drive
Topsham, ME 04086

Re: Advisory Opinion- Significant Resources associated with Oakfield, Island Falls, Dyer Brook, and other areas depicted on maps

Dear Brooke,

This letter is in response to a letter submitted by you on March 1, 2010 asking for information on resources for the proposed electrical transmission lines in the Southern Aroostook, Eastern Penobscot area. I have attached a series of maps (32 in all) showing significant resources printed on them associated with the Natural Resources Protection Act Chapters 310 (Wetlands and Water bodies) and Chapter 335 (Significant Wildlife Habitat).

I have included 2 maps for each approximate township provided in your letter. The first map for each approximate township area shows mapped wetlands and streams/rivers. The second map provided shows areas of Inland Wading Bird Habitat. Please note that not all areas of this proposed project lie in the jurisdiction of the DEP. The unorganized portions of the project lie in LURC territory and are subject to LURC regulations. It is also important to note that streams and rivers flowing in organized municipalities may be subject to Shoreland Zoning and may have different setbacks as detailed in the Natural Resource Protection Act. Please contact town officials in the towns affected by the project for such information regarding shoreland zoned bodies of water. Maps 1-4 Show the 3 Towns, Maps 5-18 Show the route of the Potential Transmission line and Maps 19-32 show the route of Line Corridors.

It is also important to note that all information provided is for informational purposes only and that any project submitted to the DEP for review, must include wetland surveys from qualified professionals including vernal pool information. Please contact the US Army Corps of Engineers regarding federal rules on wetlands and navigable waters as well as any other local and state regulatory agencies regarding natural resources.

Important information regarding these resources associated with wildlife habitat may also be obtained from the Inland Fisheries and Wildlife Department, Please contact Biologist Rich Hoppe in the Ashland, Maine office @ (207) 435-3231.

I hope this serves your immediate need for information regarding this matter. Please contact me if I can be of further assistance (207) 764-0477.

Sincerely,

Eric Hitchcock, Maine DEP
Bureau of Land and Water Quality
Div. of Land Resource Regulation

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

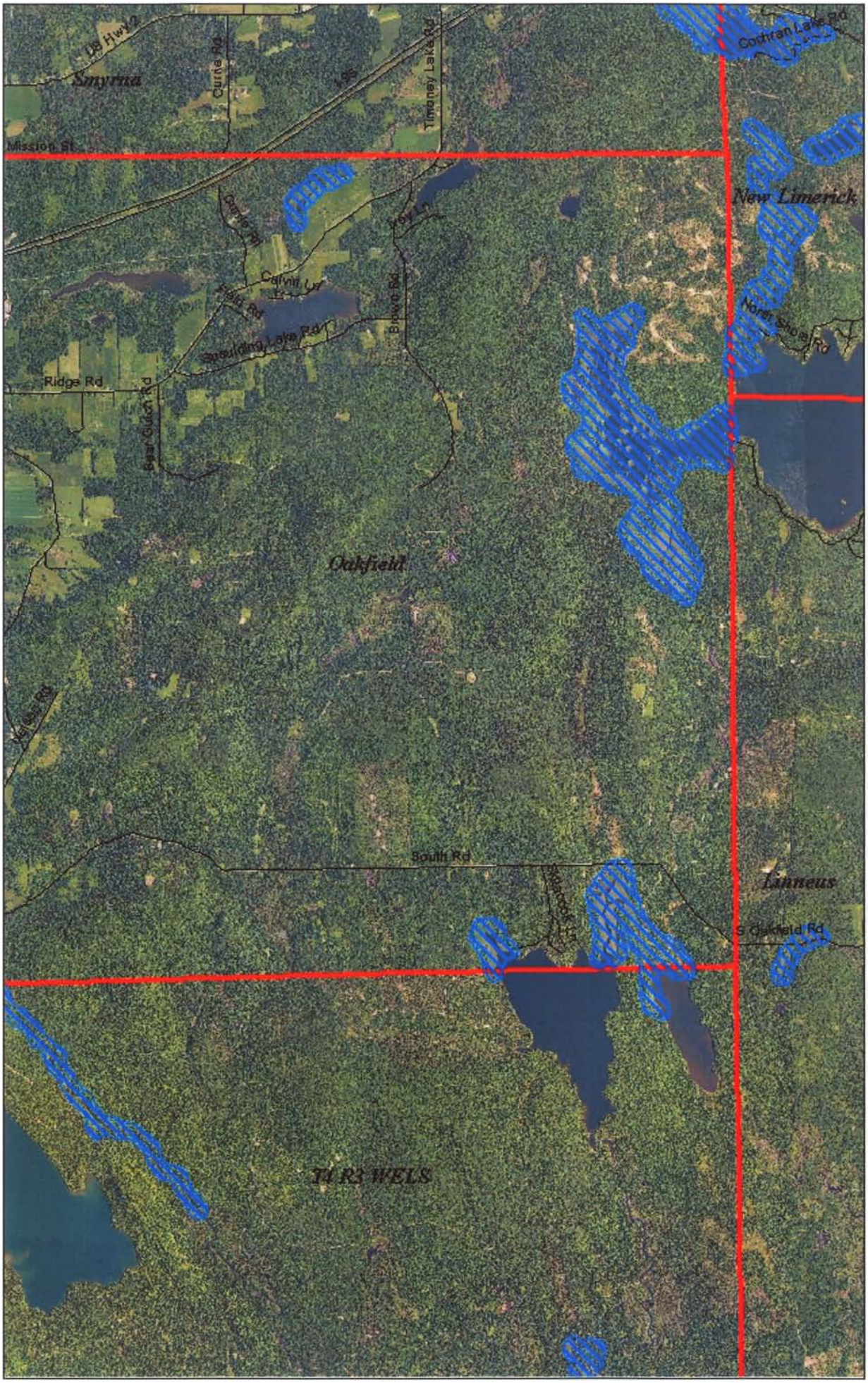
BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

printed on recycled paper

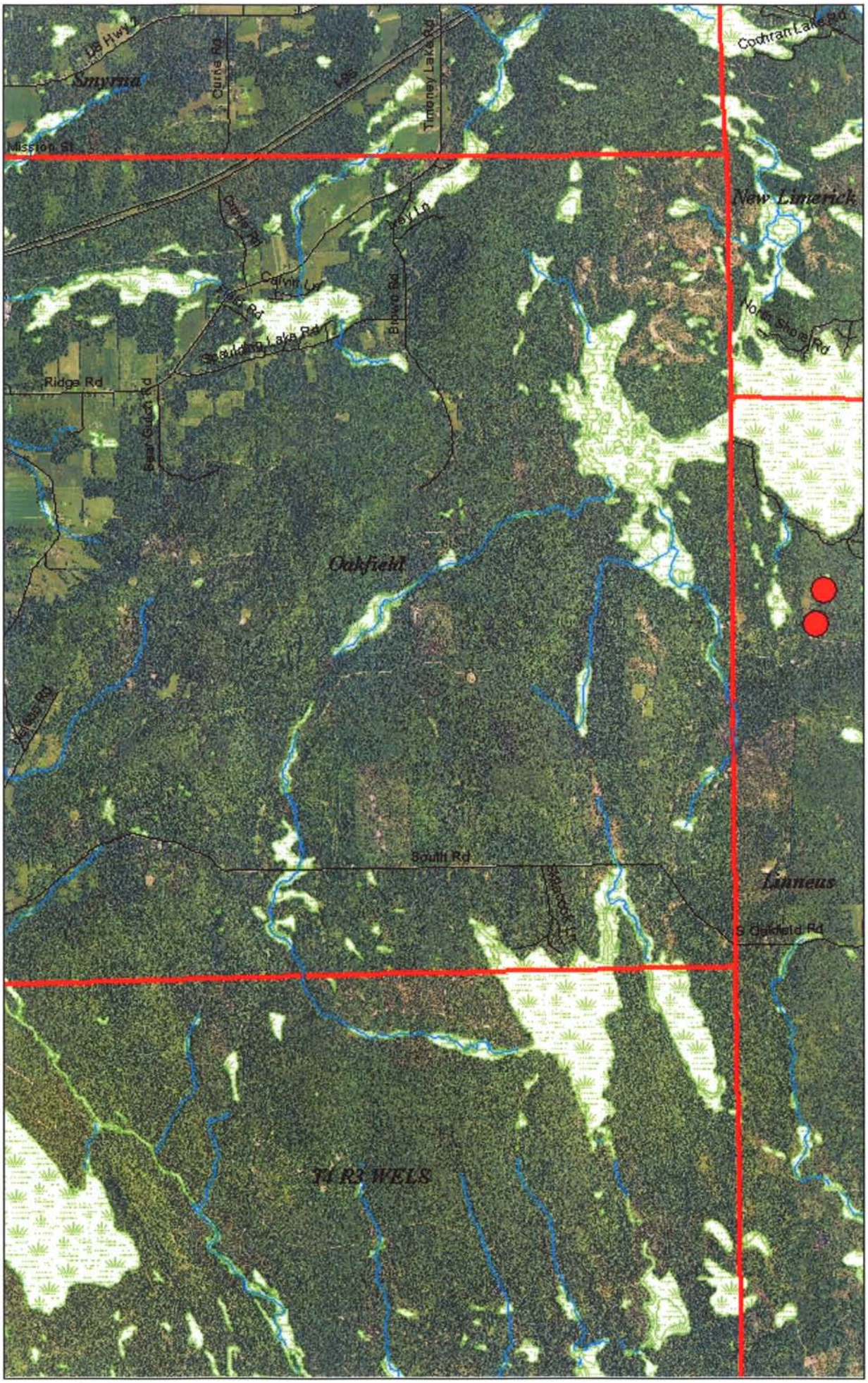


MAP 1

Oakfield, ME
Inland Wading
Bird Habitat

1:58,916

1 inch = 4,909.7 feet

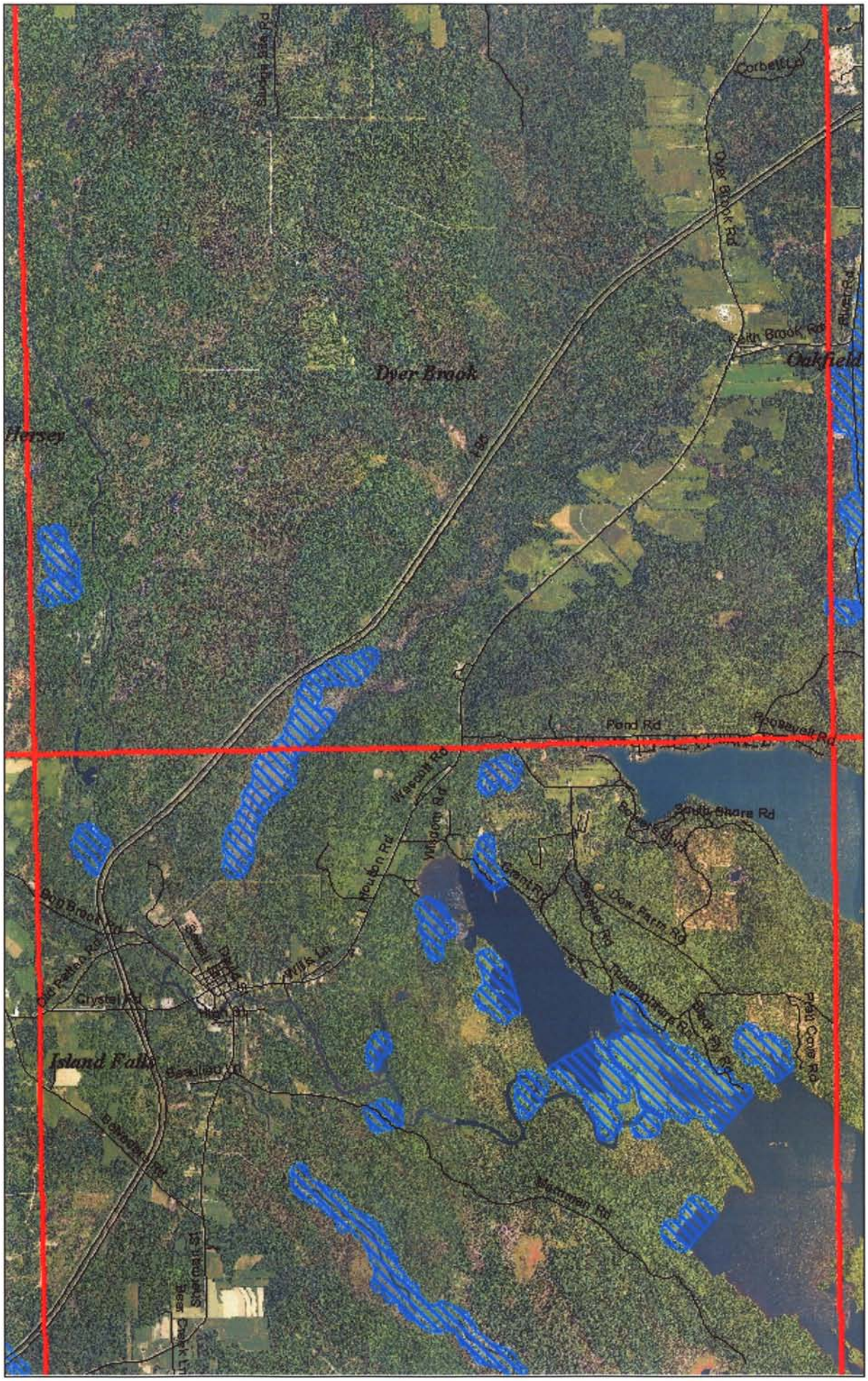


MAP 2

Oakfield, ME Streams and Wetlands

1:58,916

1 inch = 4,909.7 feet

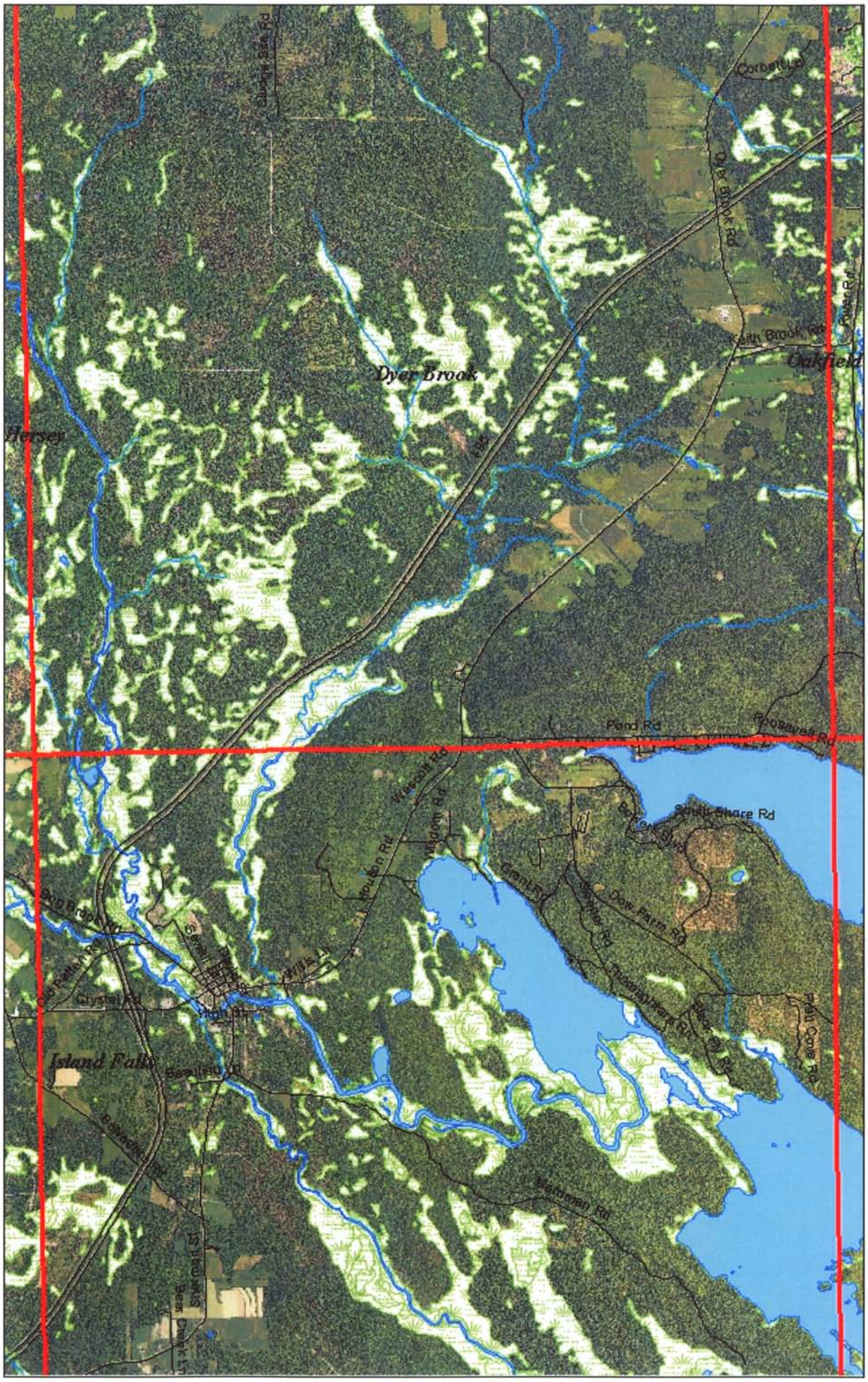


Map 3

Dyer Brook, ME
Island Falls, ME

Inland Wading Bird Habitat

1:65,716
1 inch = 5,476.31 feet

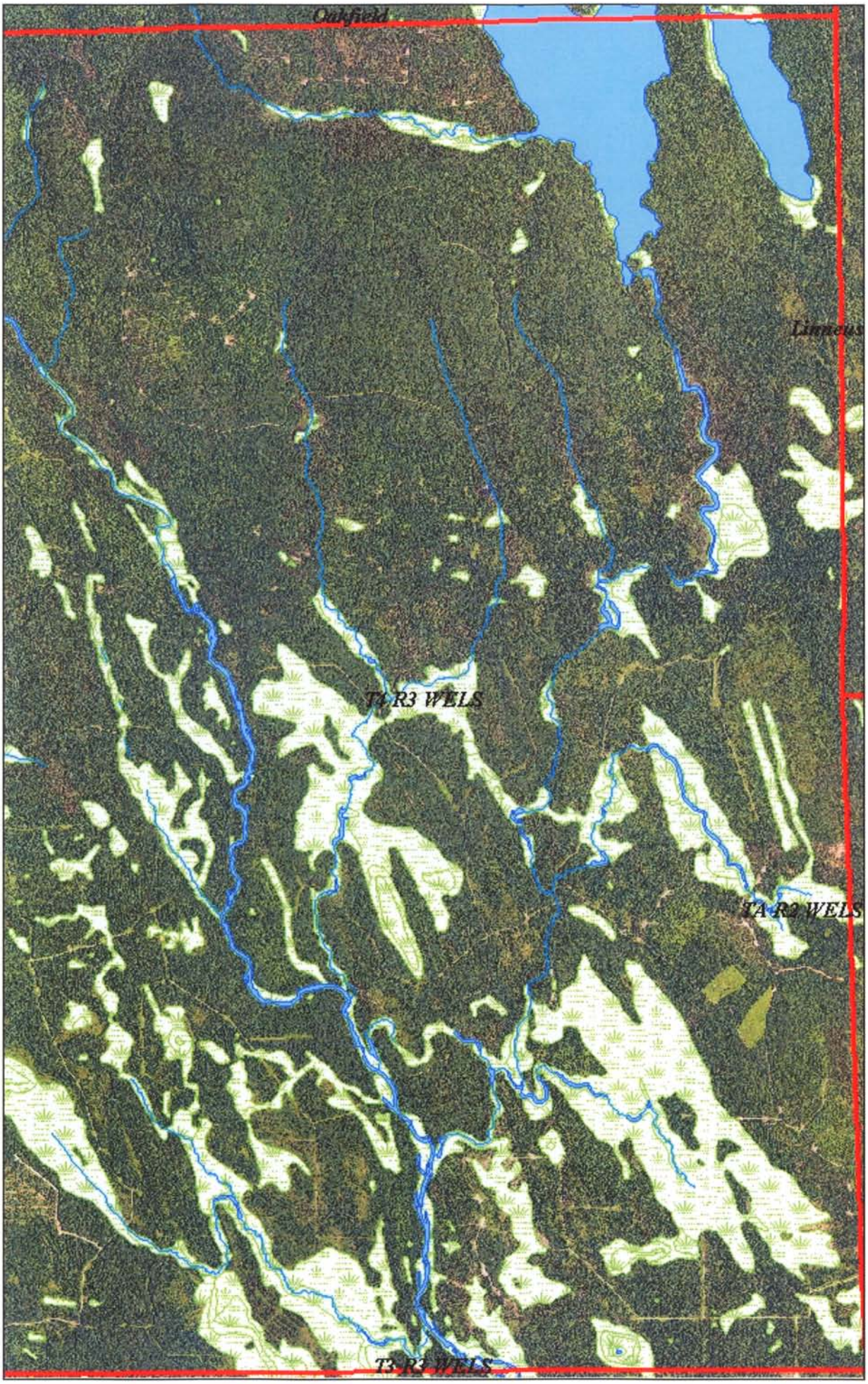


Map 4

Dyer Brook, ME
Island Falls, ME

Streams and Wetlands

1:65,716
1 inch = 5,476.31 feet

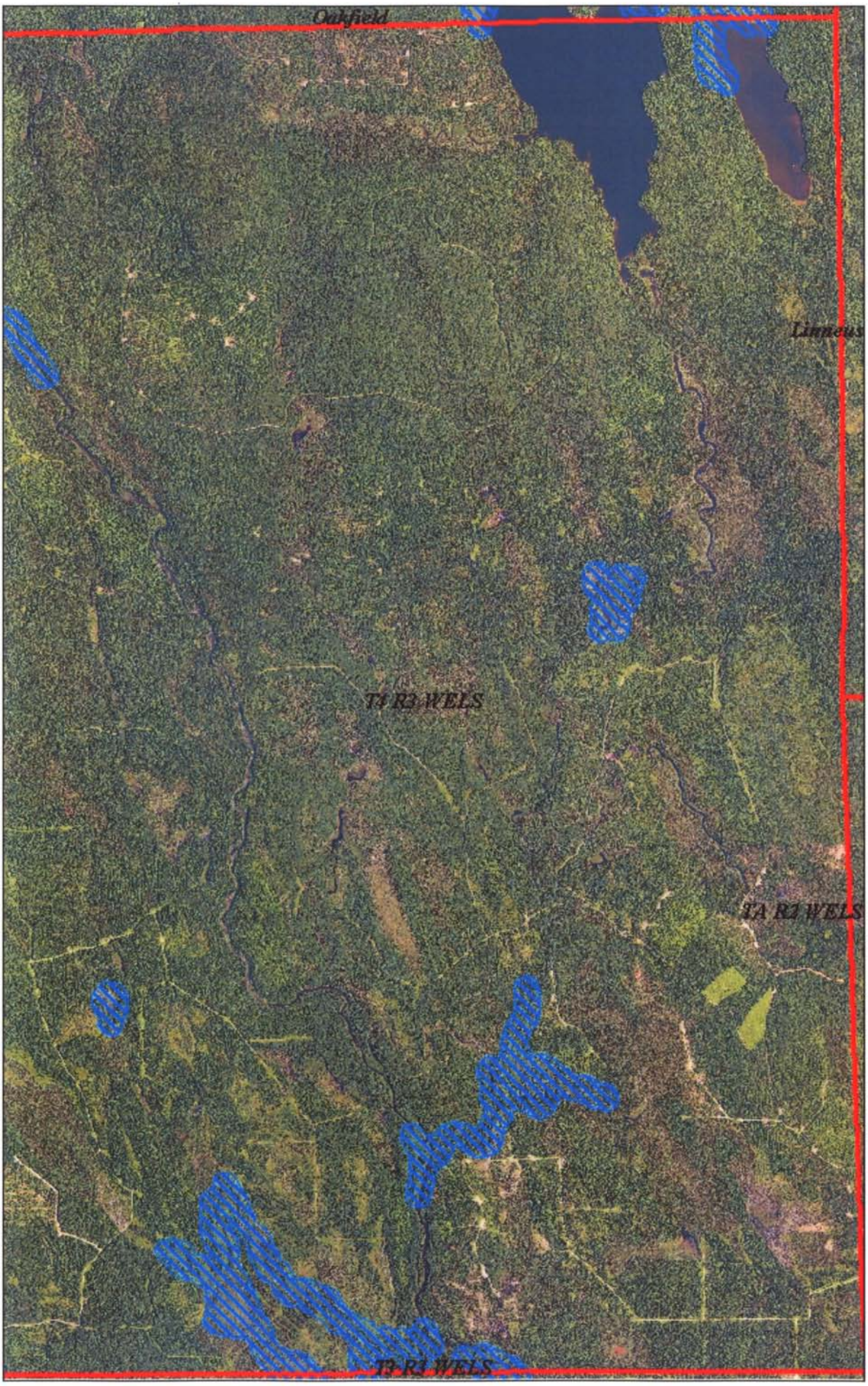


Map 5

T4 R3, ME

Streams and Wetlands

1:40,000
1 inch = 3,333.33 feet

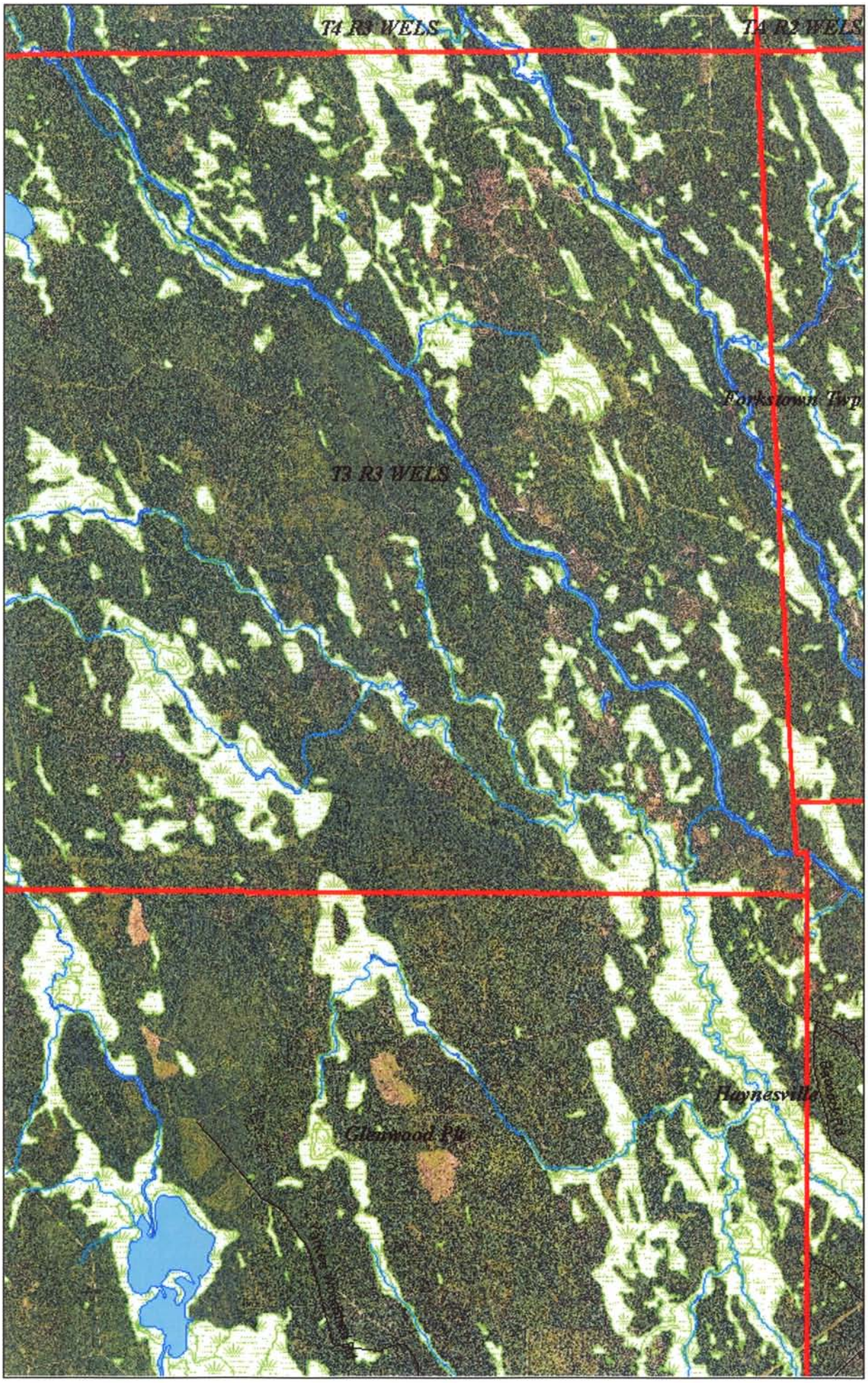


Map 6

T4 R3, ME

Inland Wading Bird Habitat

1:40,000
1 inch = 3,333.33 feet

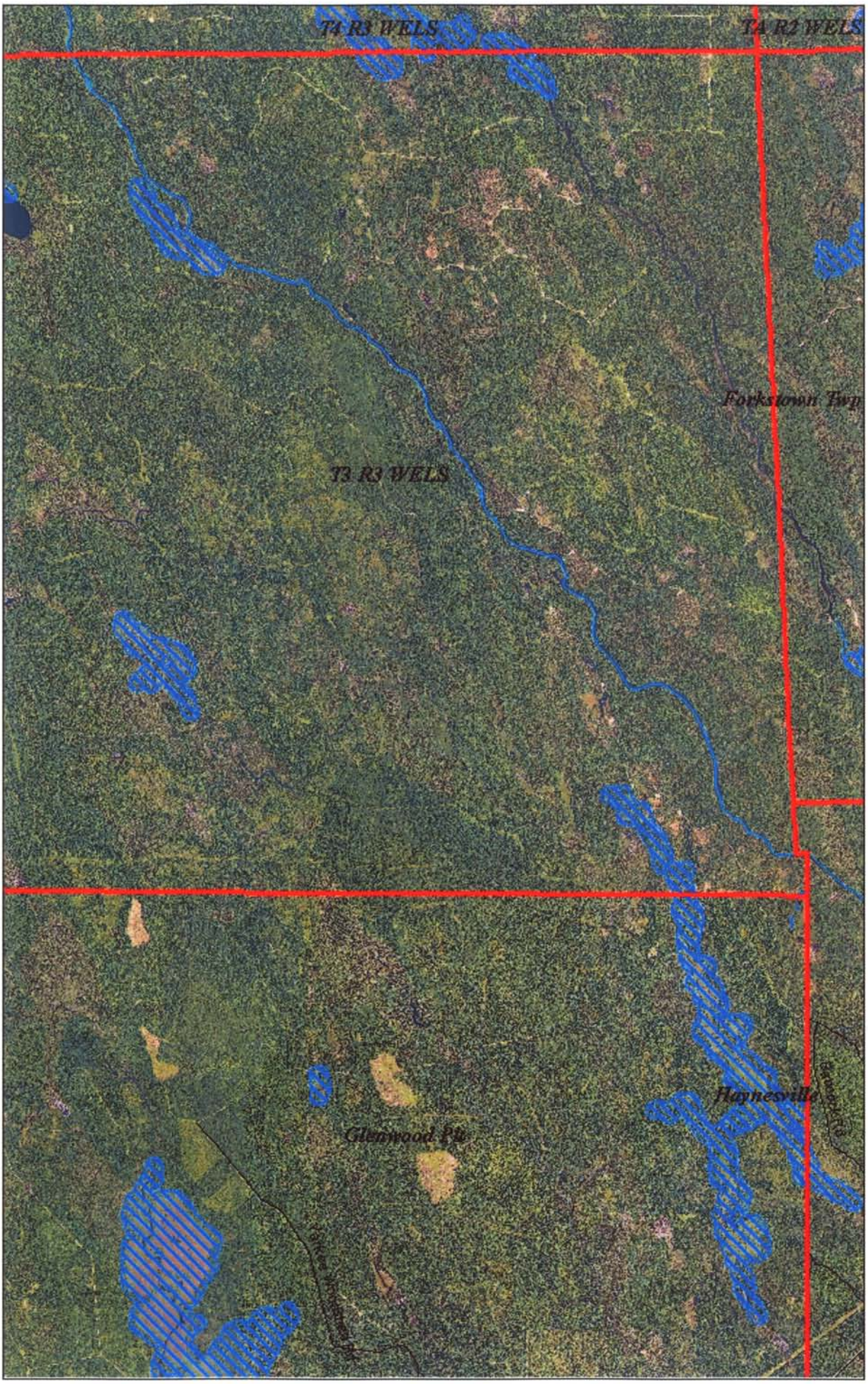


Map 7

T3 R3, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

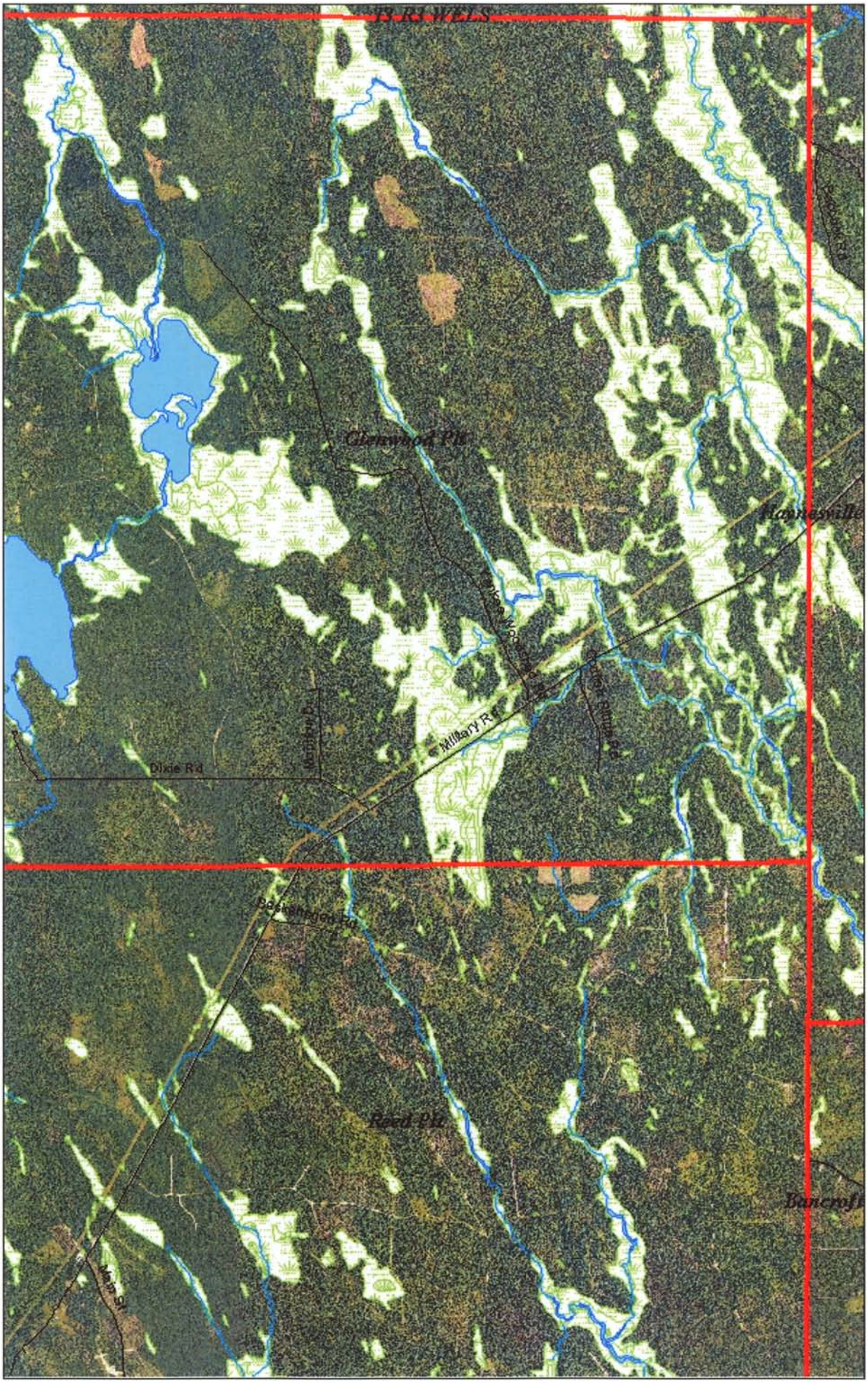


Map 8

T3 R3, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

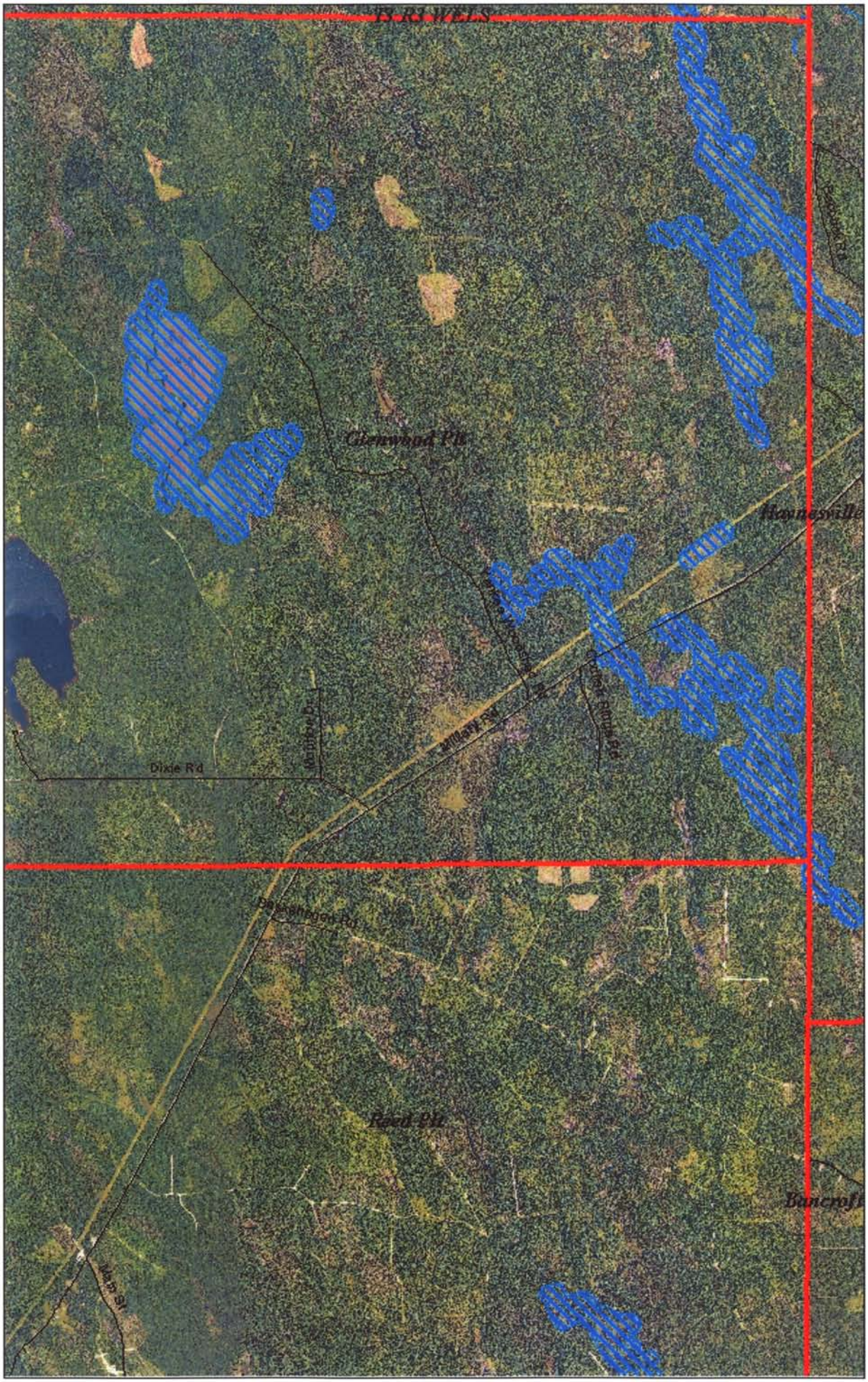


Map 9

Glenood Plt, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

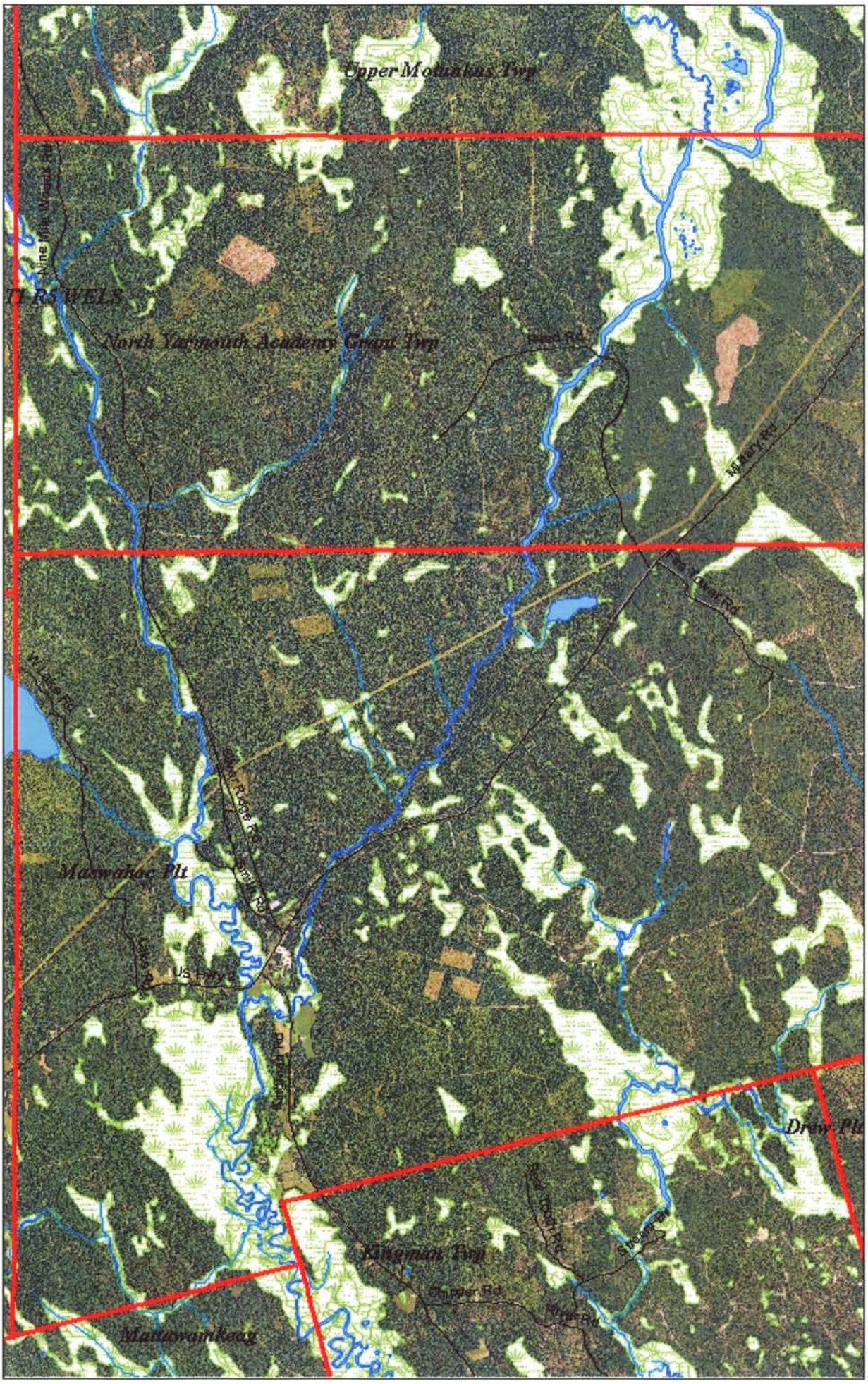


Map 10

Glenood Plt, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

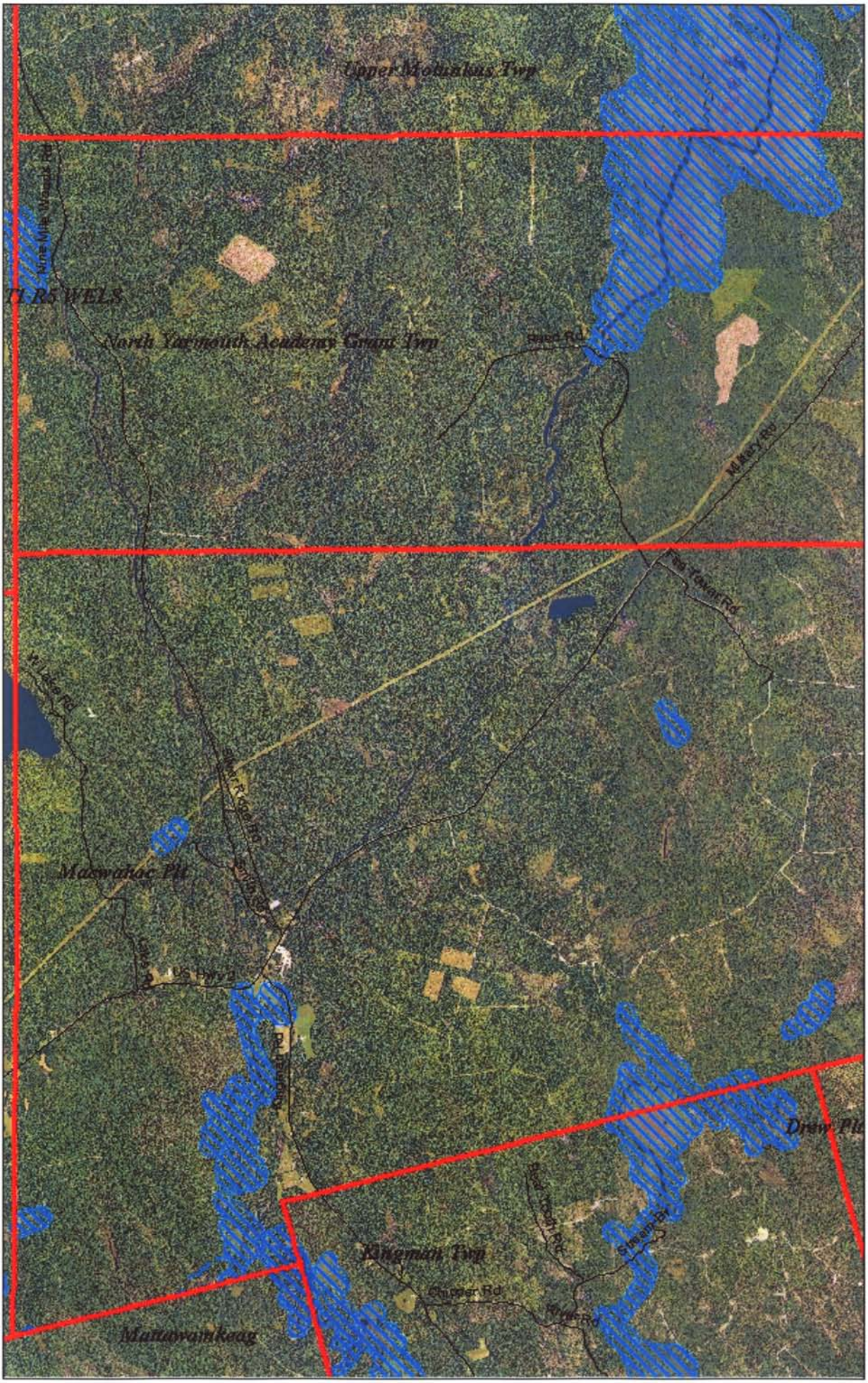


Map 11

Macwahoc PLT, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet



Map 12

Macwahoc PLT, ME

Inland Wading Bird Habitat

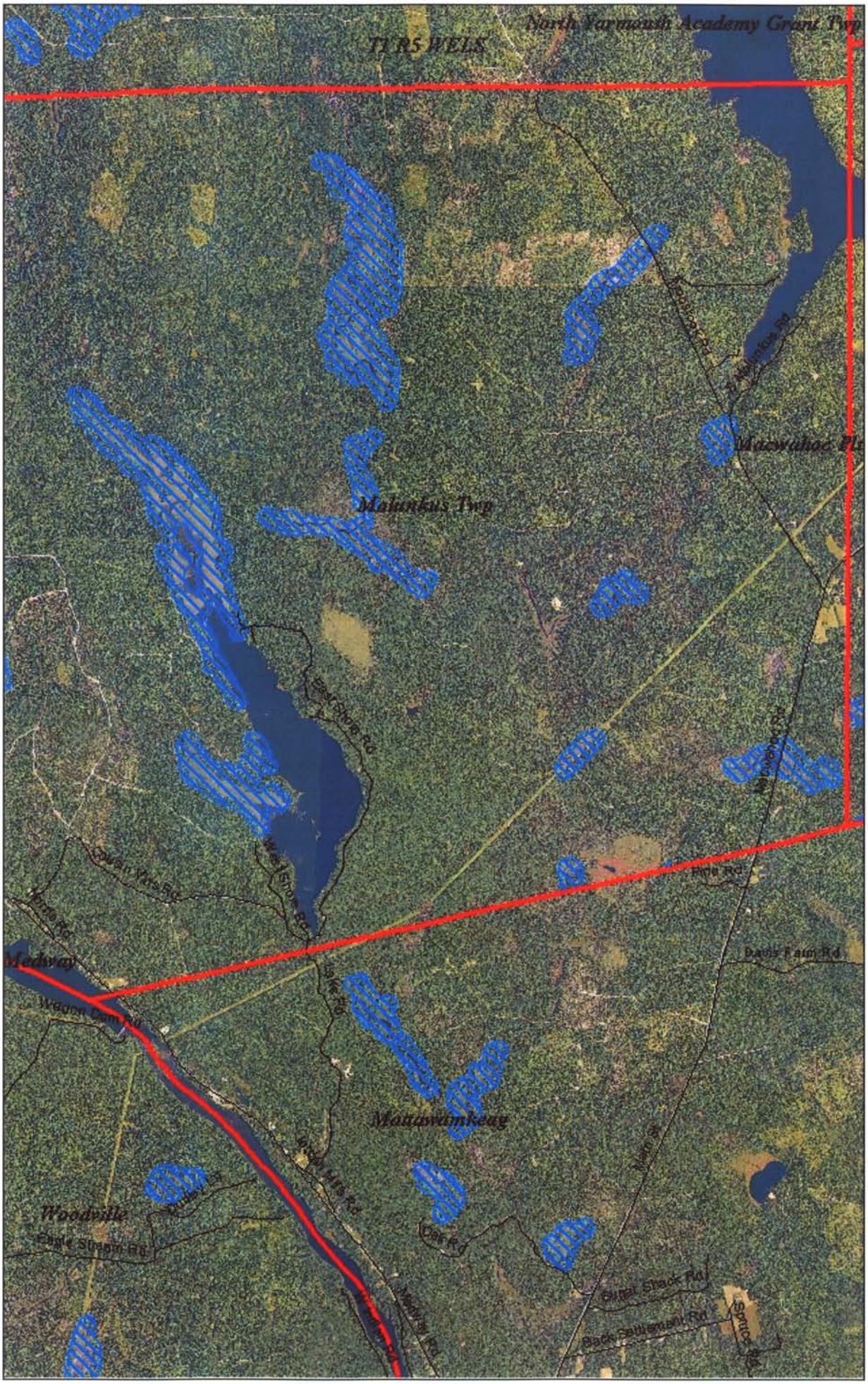
1:60,000
1 inch = 5,000 feet

Map 13

Molunkus TWP, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

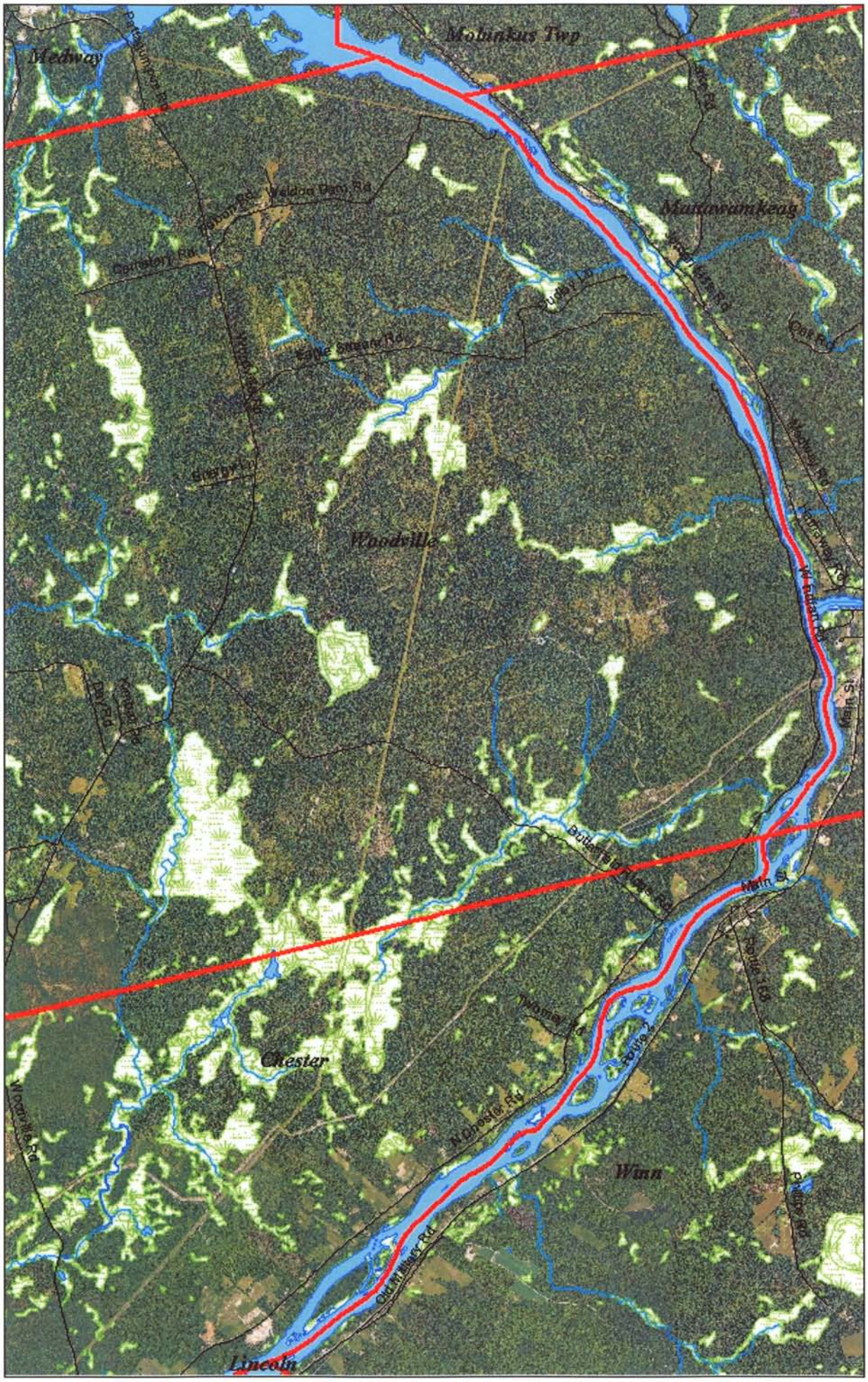


Map 14

Molunkus TWP, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

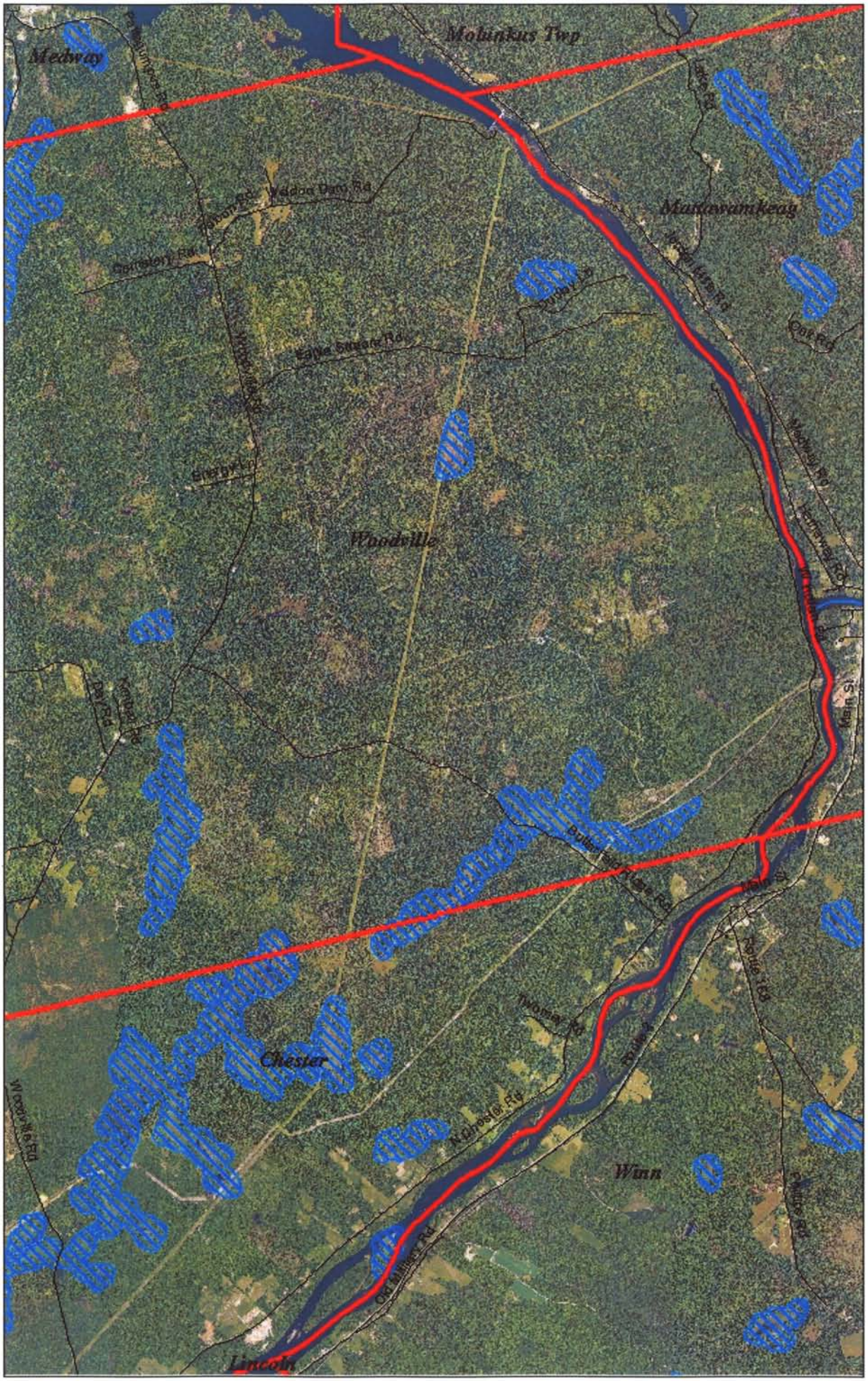


Map 15

Woodville, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

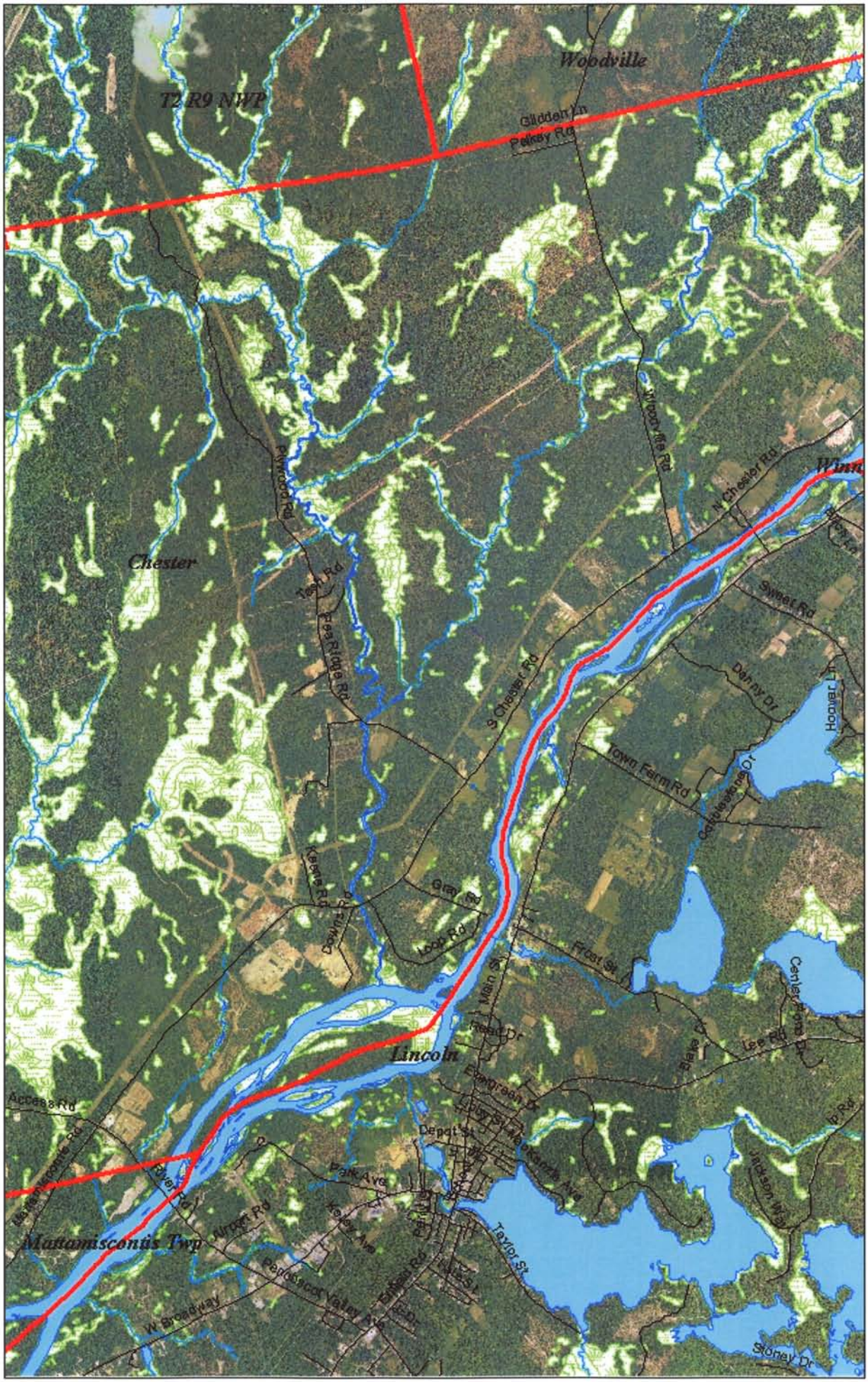


Map 16

Woodville, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

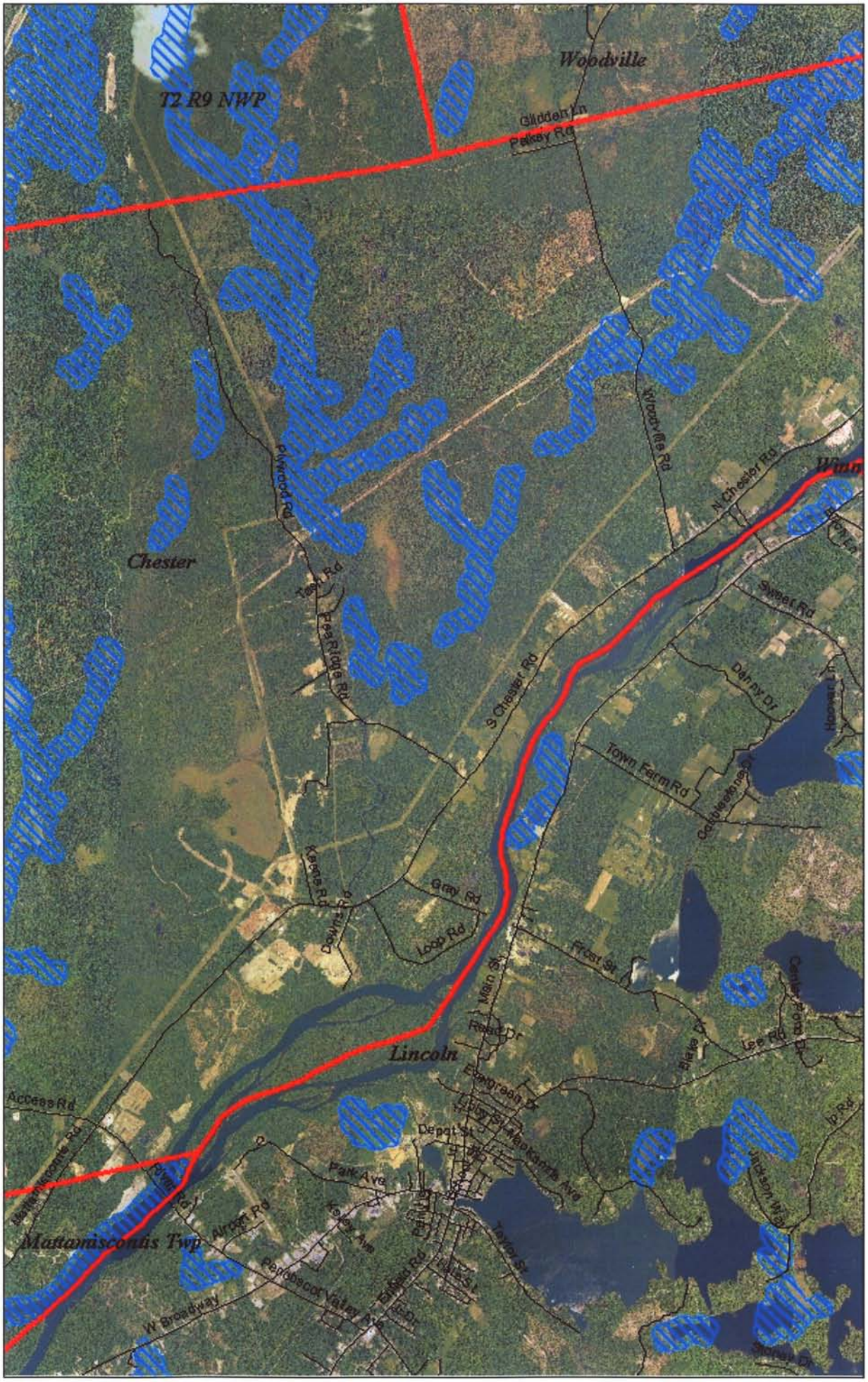


Map 17

Chester, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

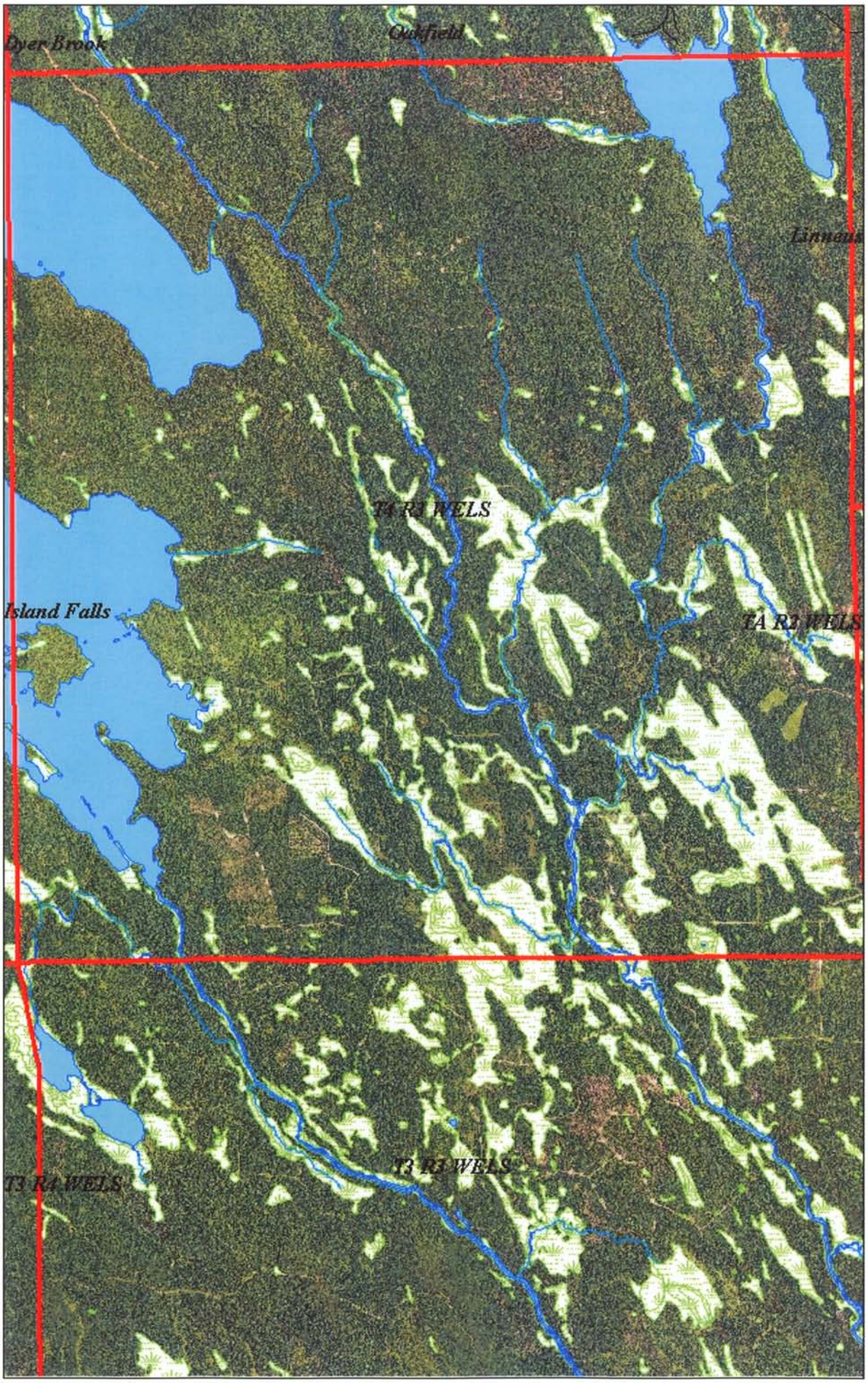


Map 18

Chester, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

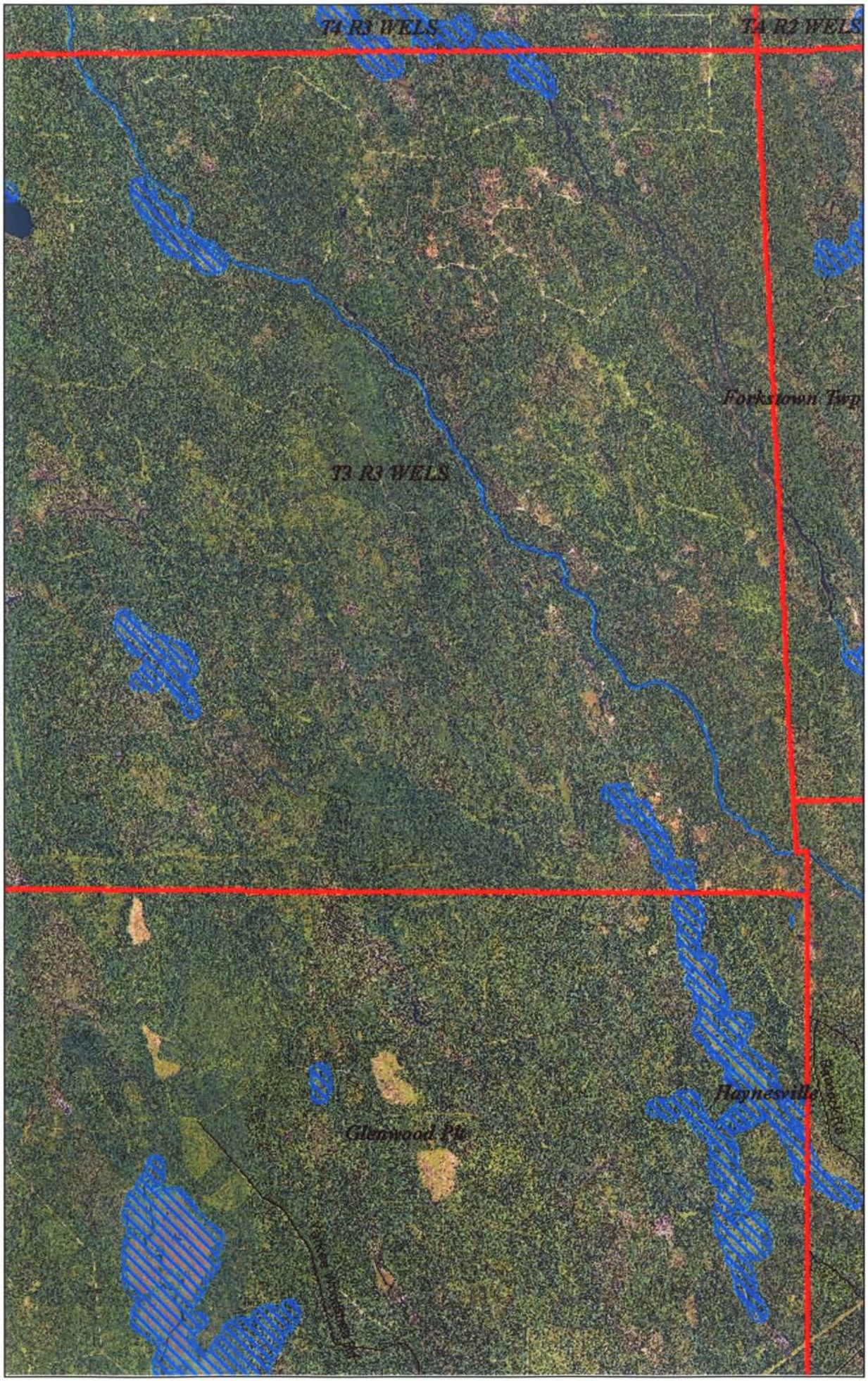


Map 19

T4 R3 WELS, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

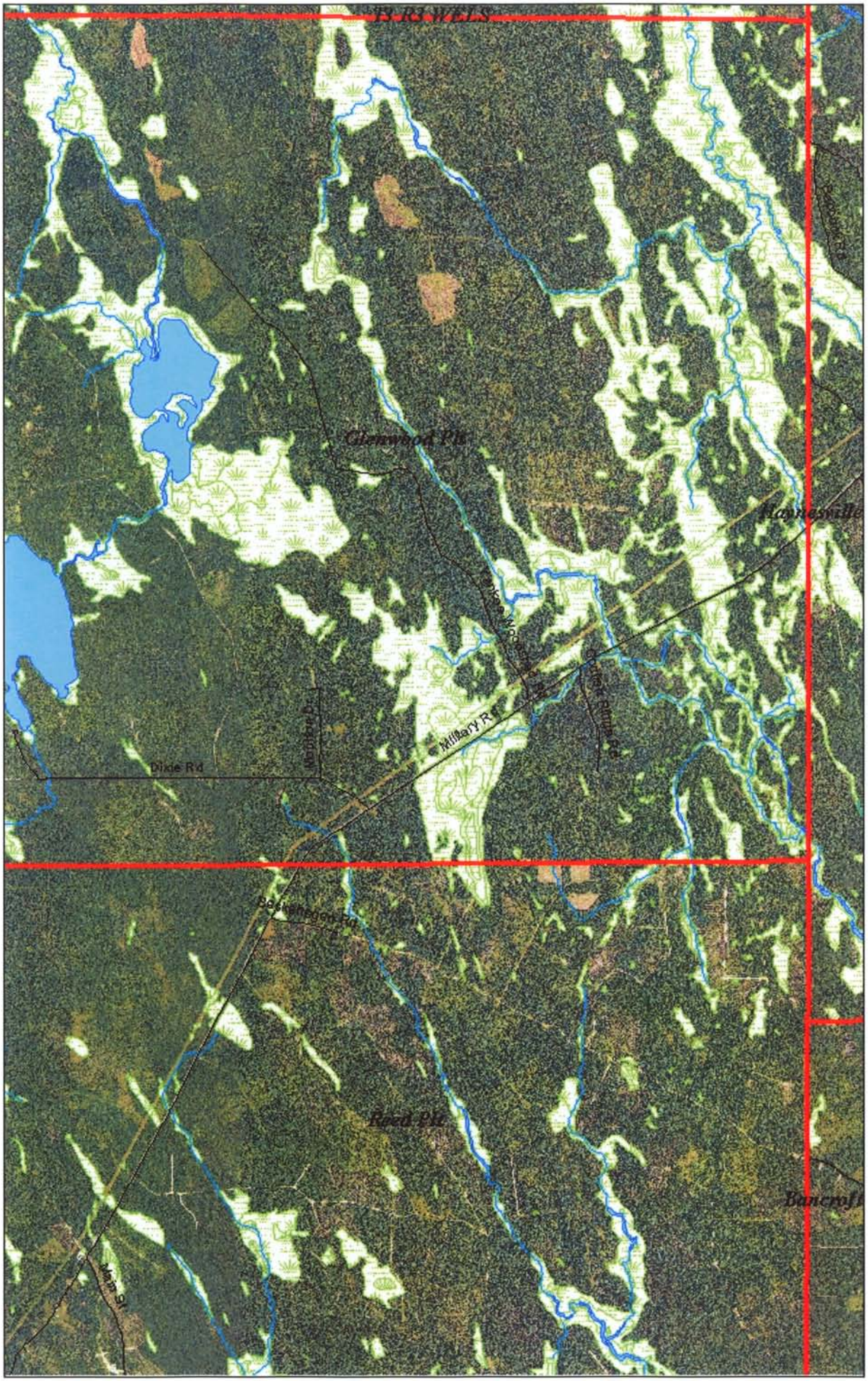


Map 8

T3 R3, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

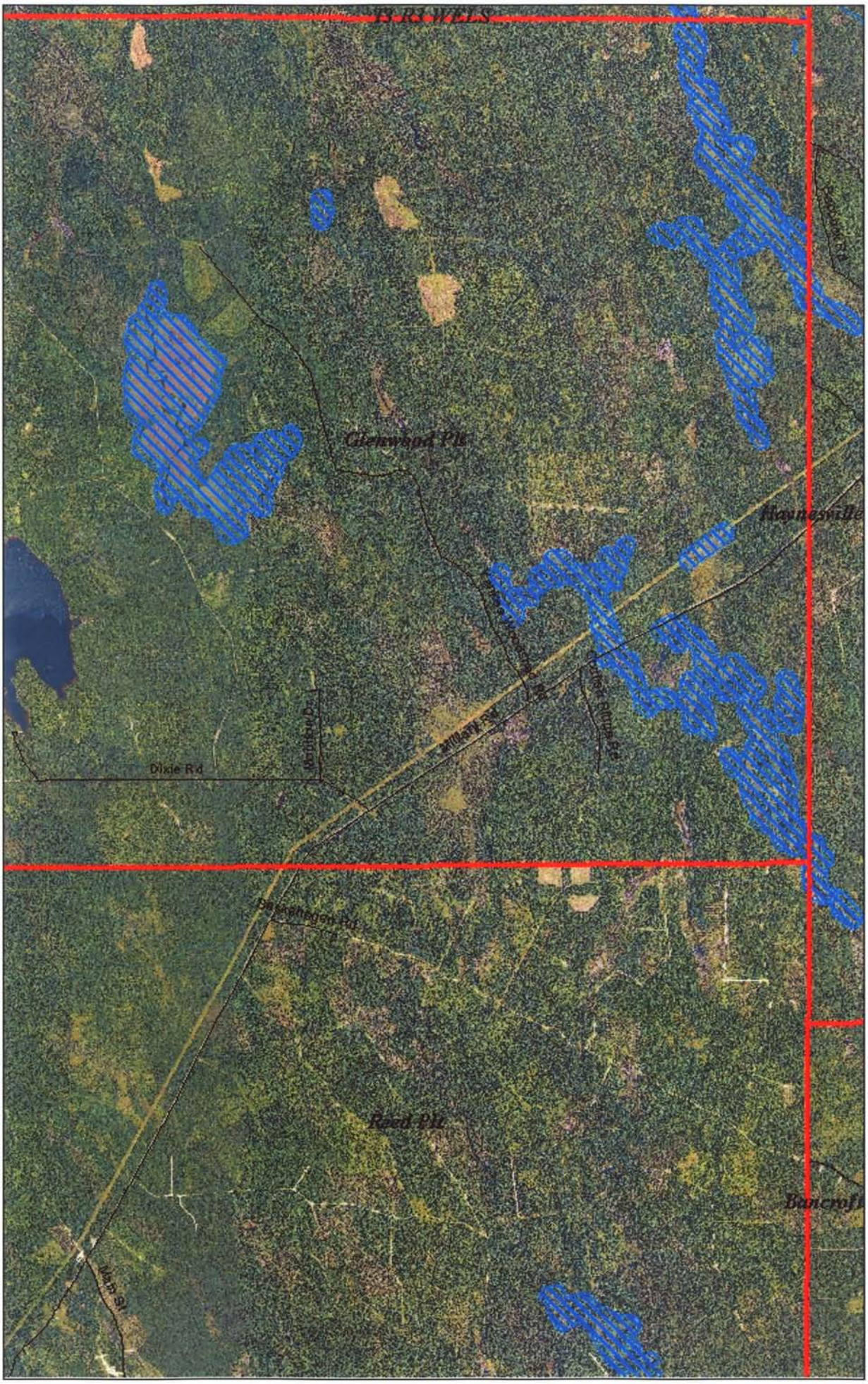


Map 9

Glenood Plt, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

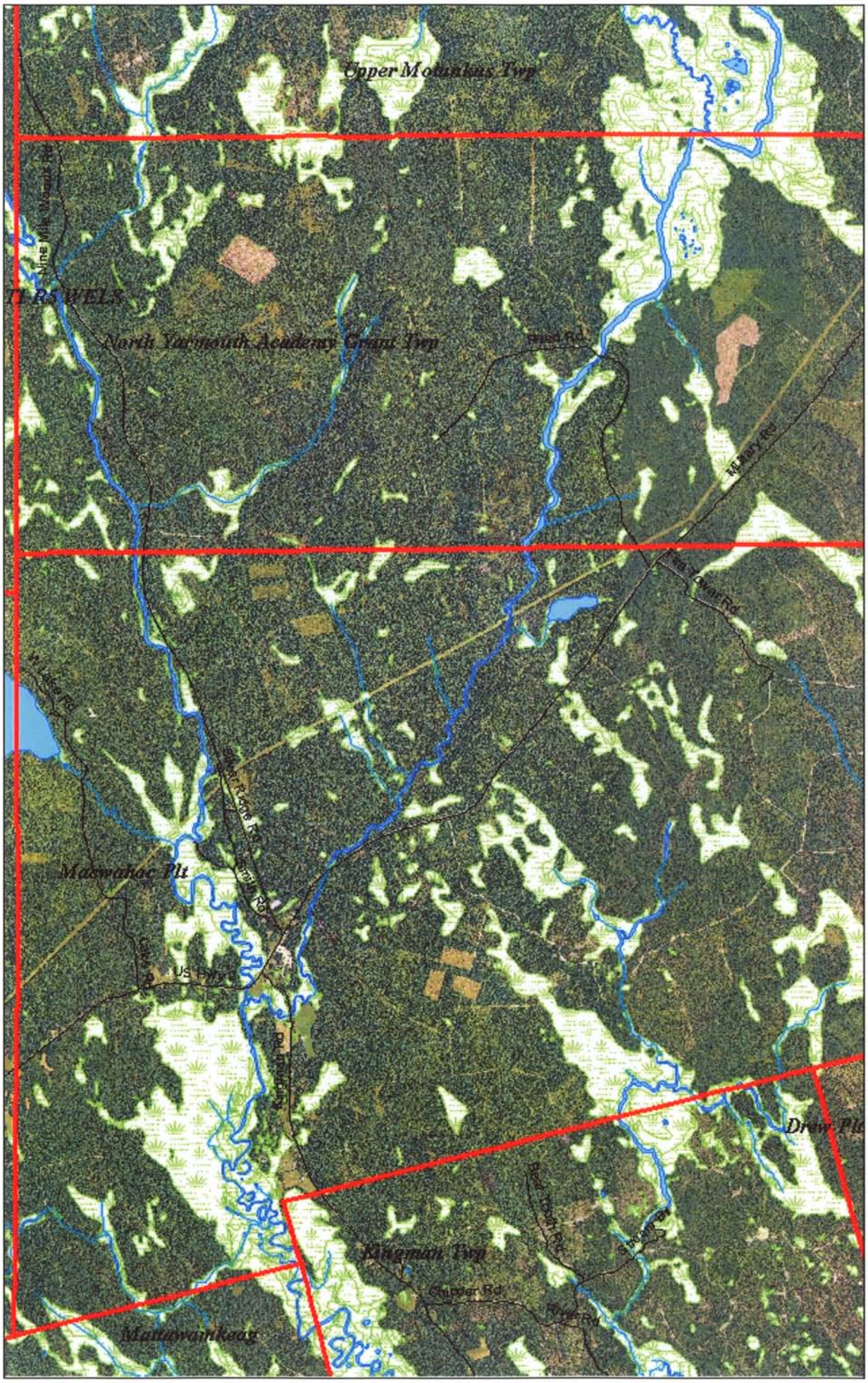


Map 10

Glenood Plt, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

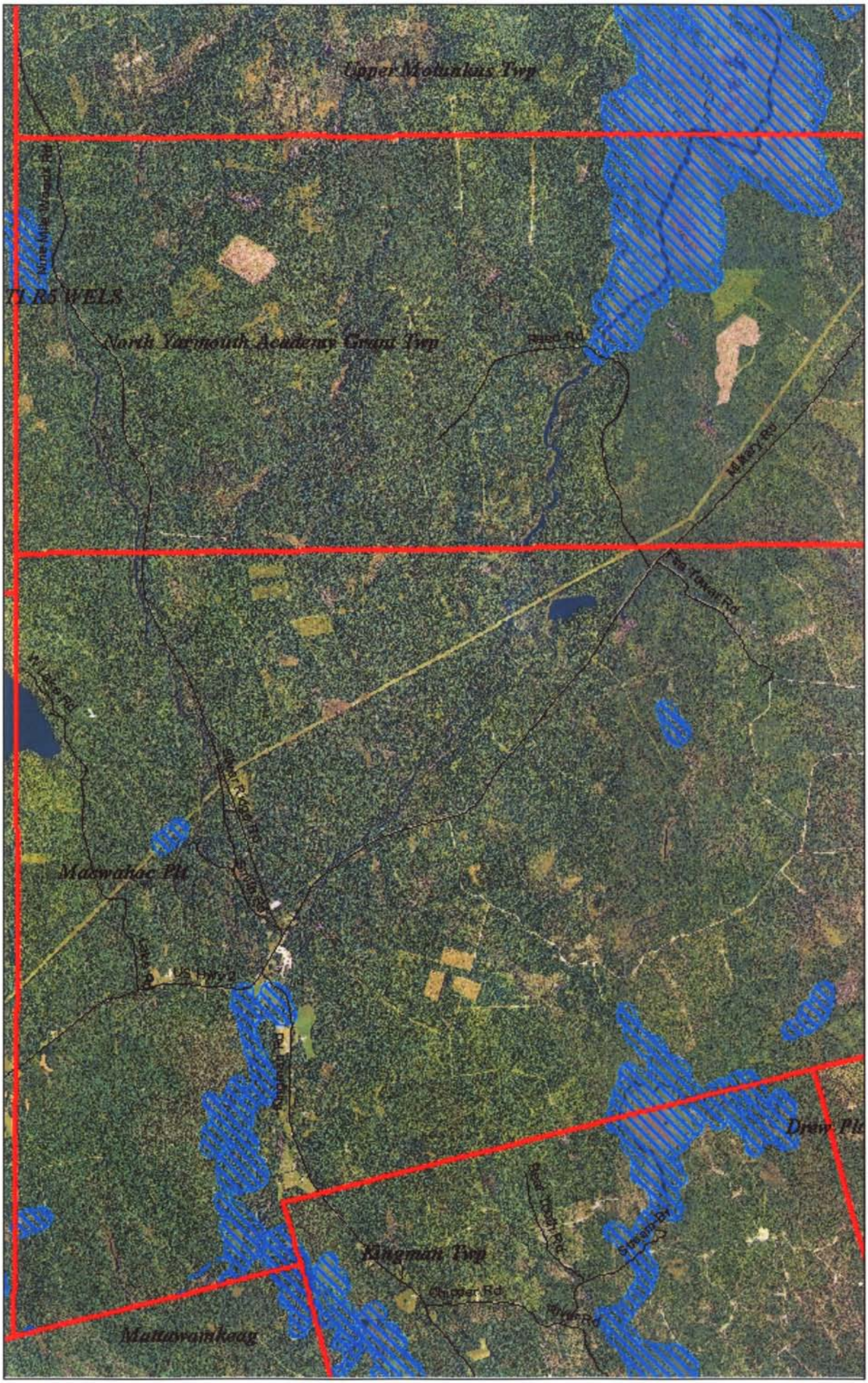


Map 11

Macwahoc PLT, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

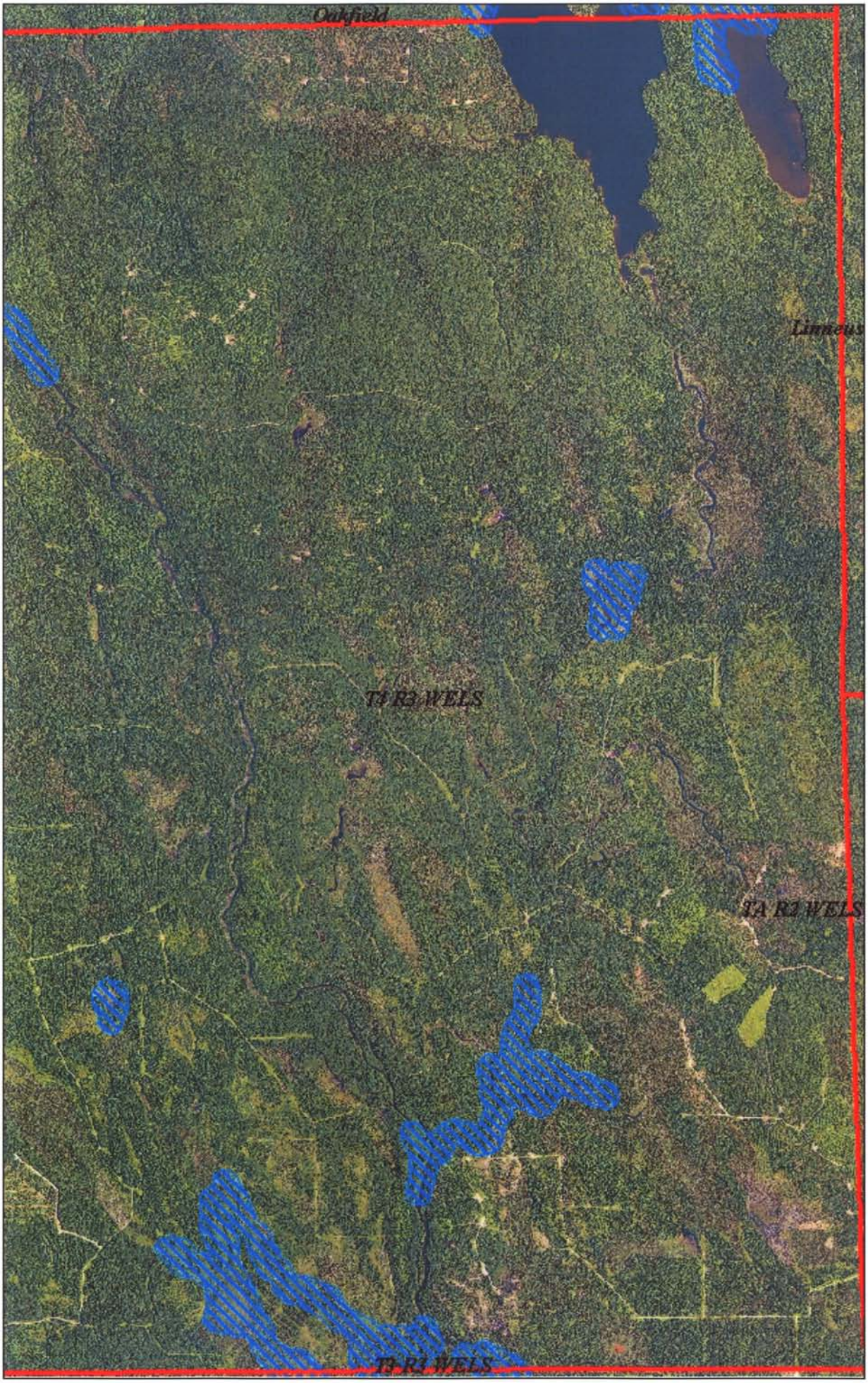


Map 12

Macwahoc PLT, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

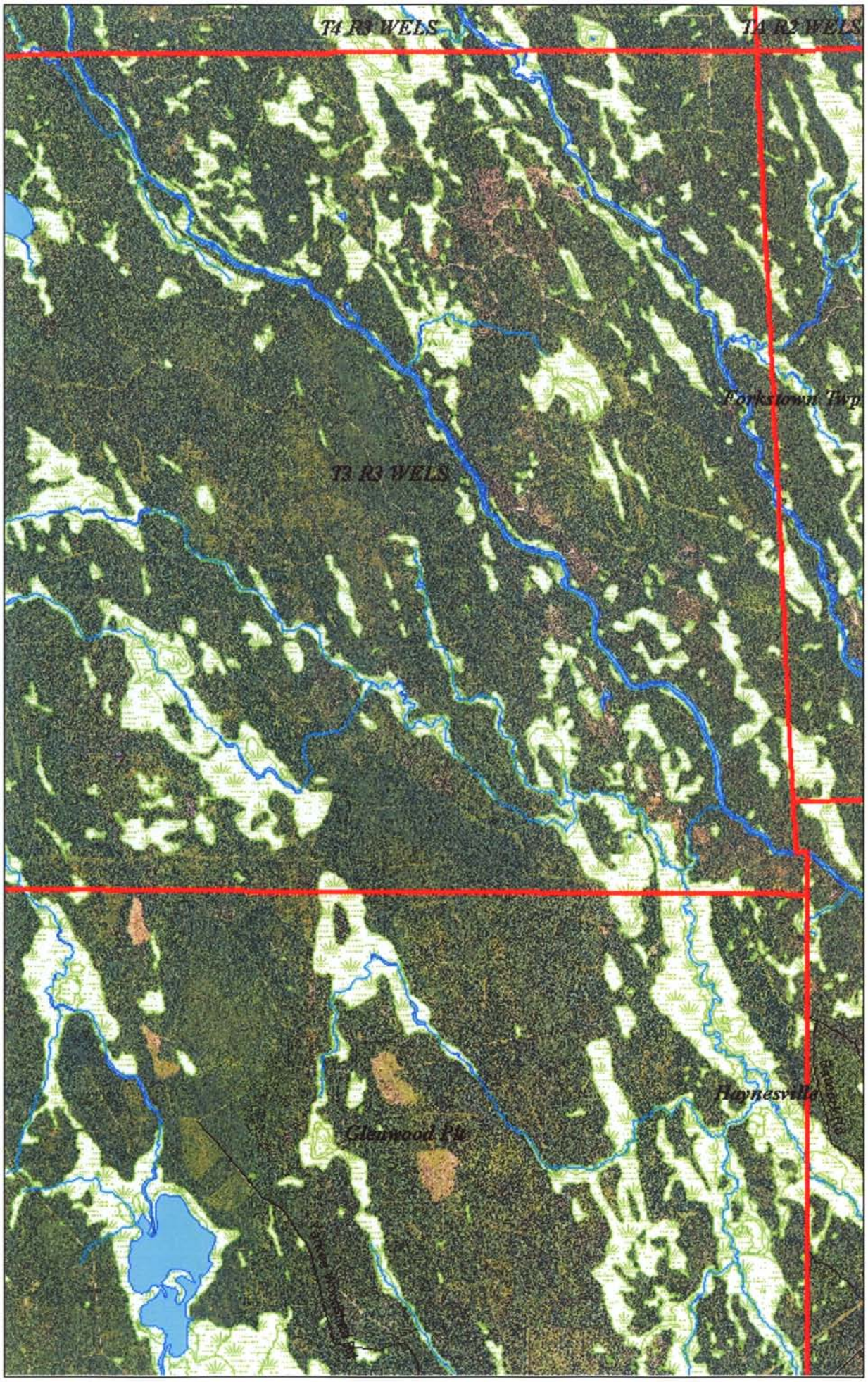


Map 6

T4 R3, ME

Inland Wading Bird Habitat

1:40,000
1 inch = 3,333.33 feet

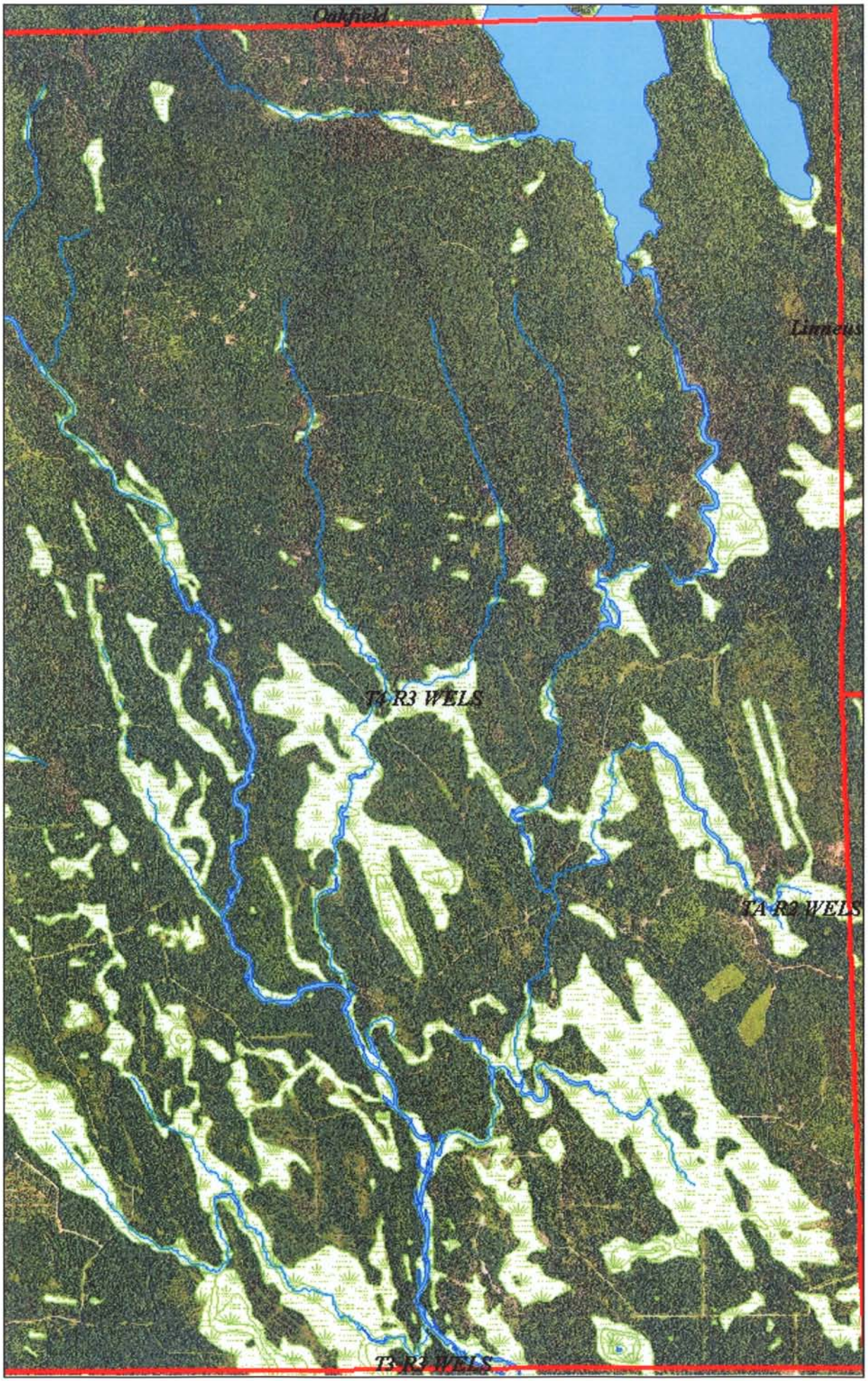


Map 7

T3 R3, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

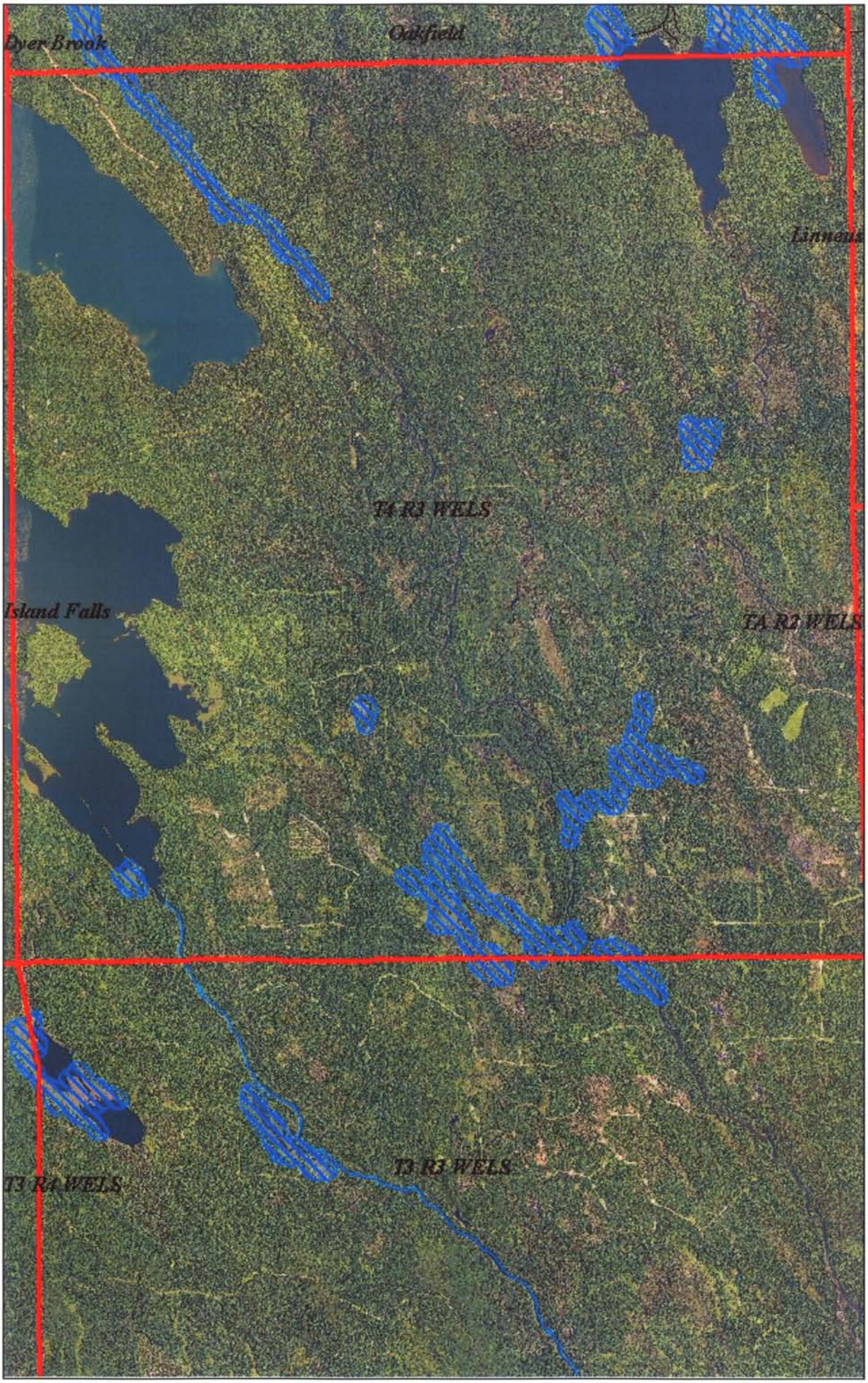


Map 5

T4 R3, ME

Streams and Wetlands

1:40,000
1 inch = 3,333.33 feet

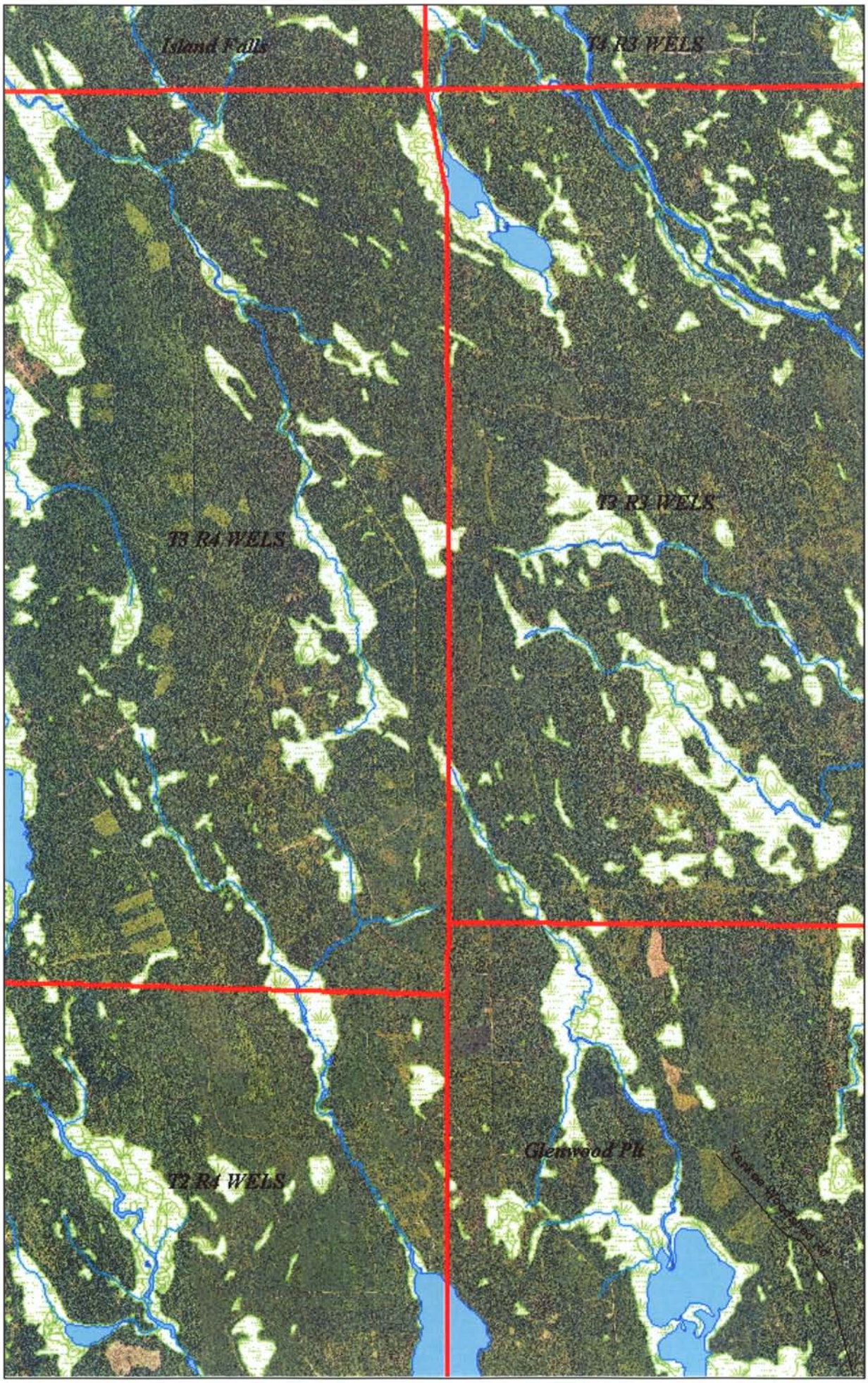


Map 20

T4 R3 WELS, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet

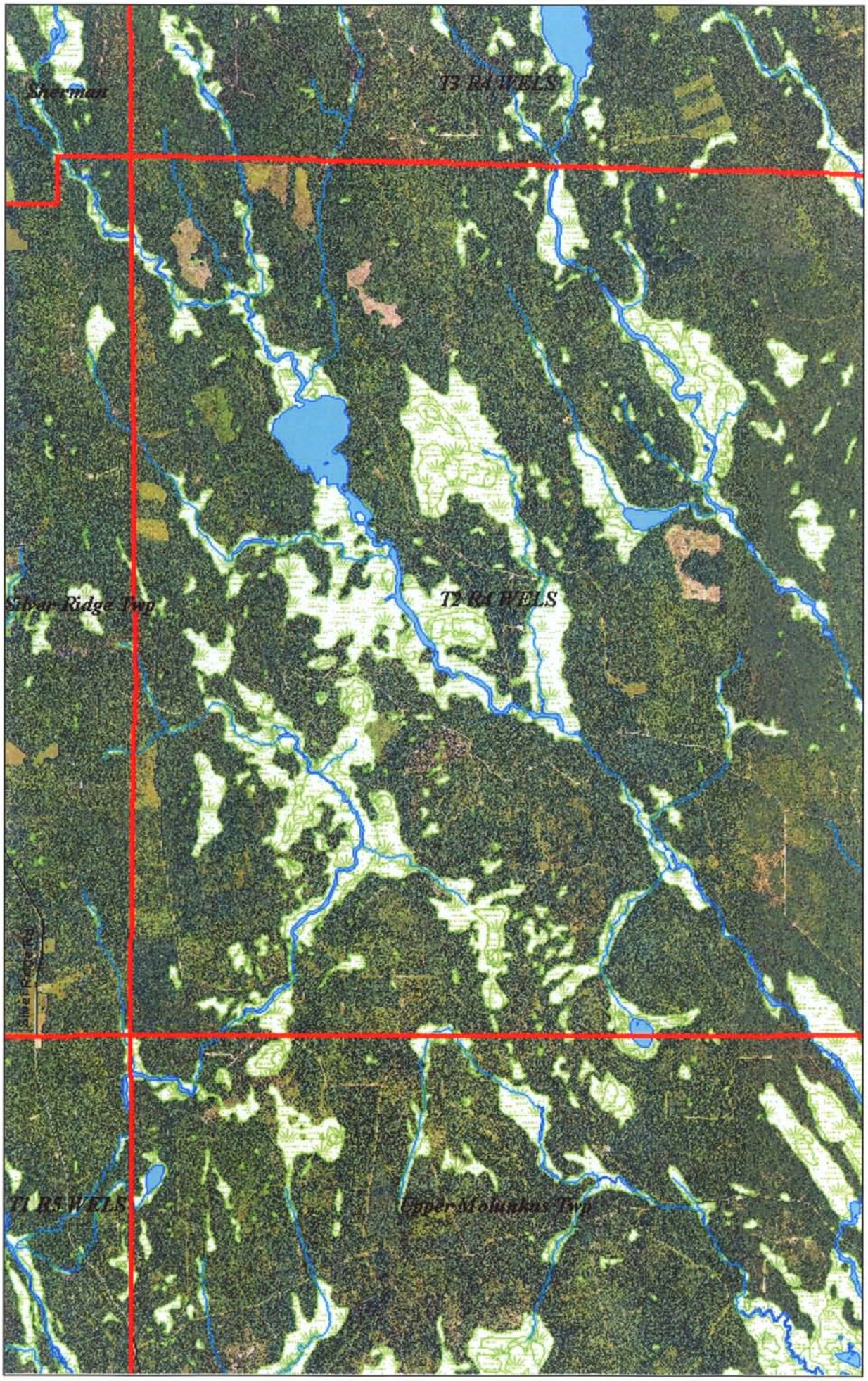


Map 21

T3 R3, T3R4, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

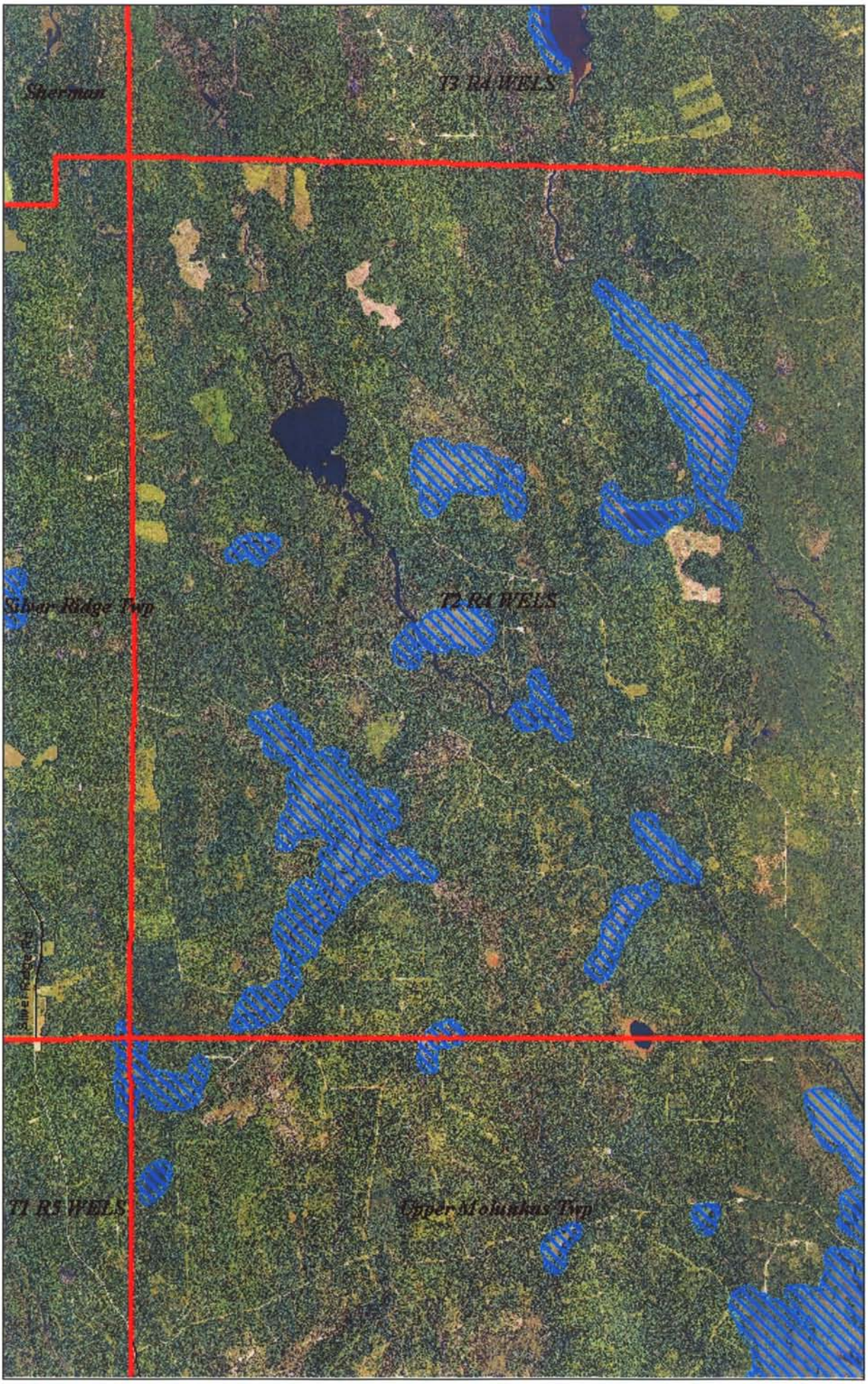


Map 23

Silver Ridge, T2R4, ME

Streams and Wetlands

1:60,000
1 inch = 5,000 feet

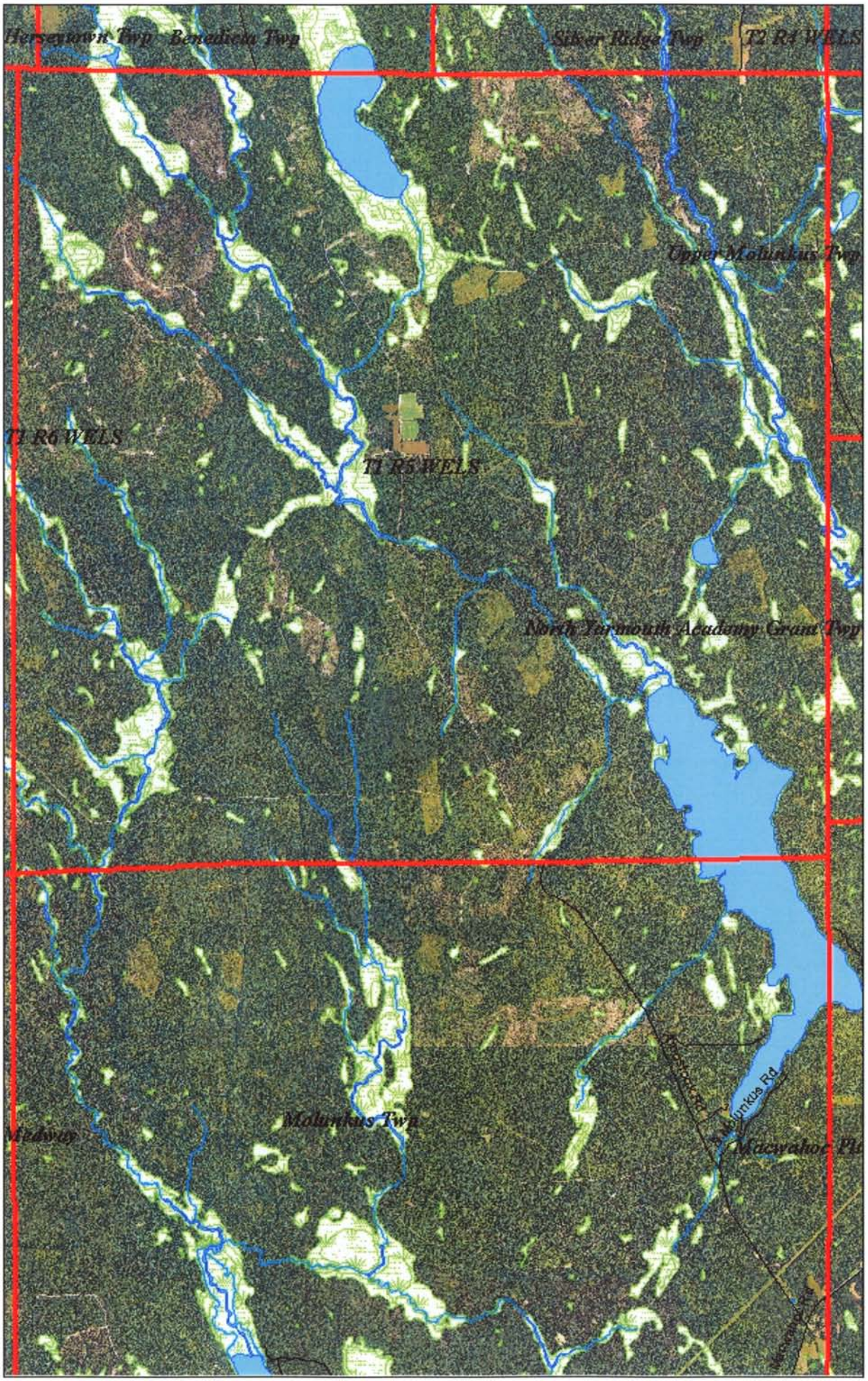


Map 24

Silver Ridge, T2R4, ME

Inland Wading Bird Habitat

1:60,000
1 inch = 5,000 feet



Map 25

T1R5, ME

Streams and Wetlands

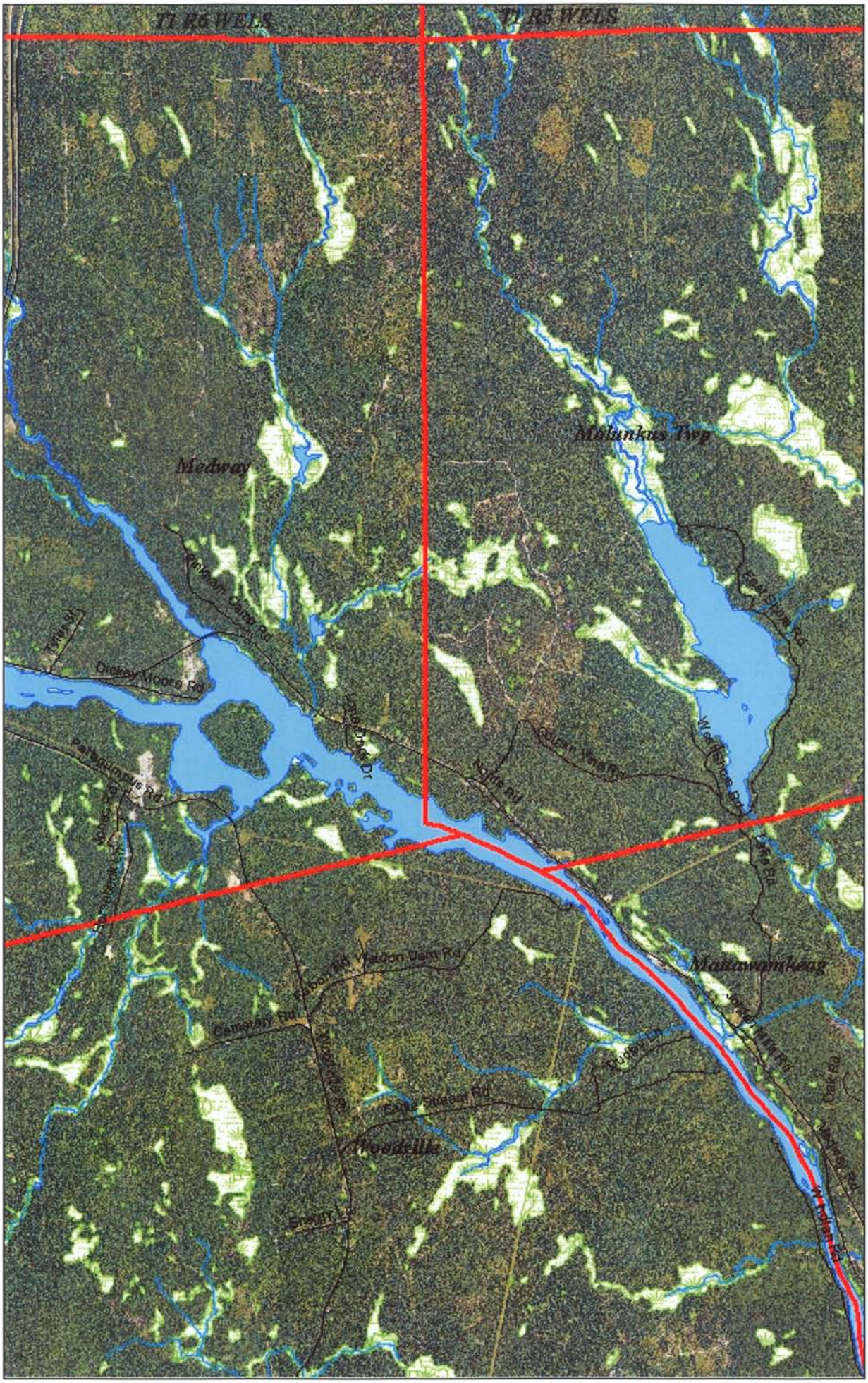
1:65,000
1 inch = 5,416.67 feet

Map 26

T1R5, ME

Inland Wading Bird Habitat

1:65,000
1 inch = 5,416.67 feet

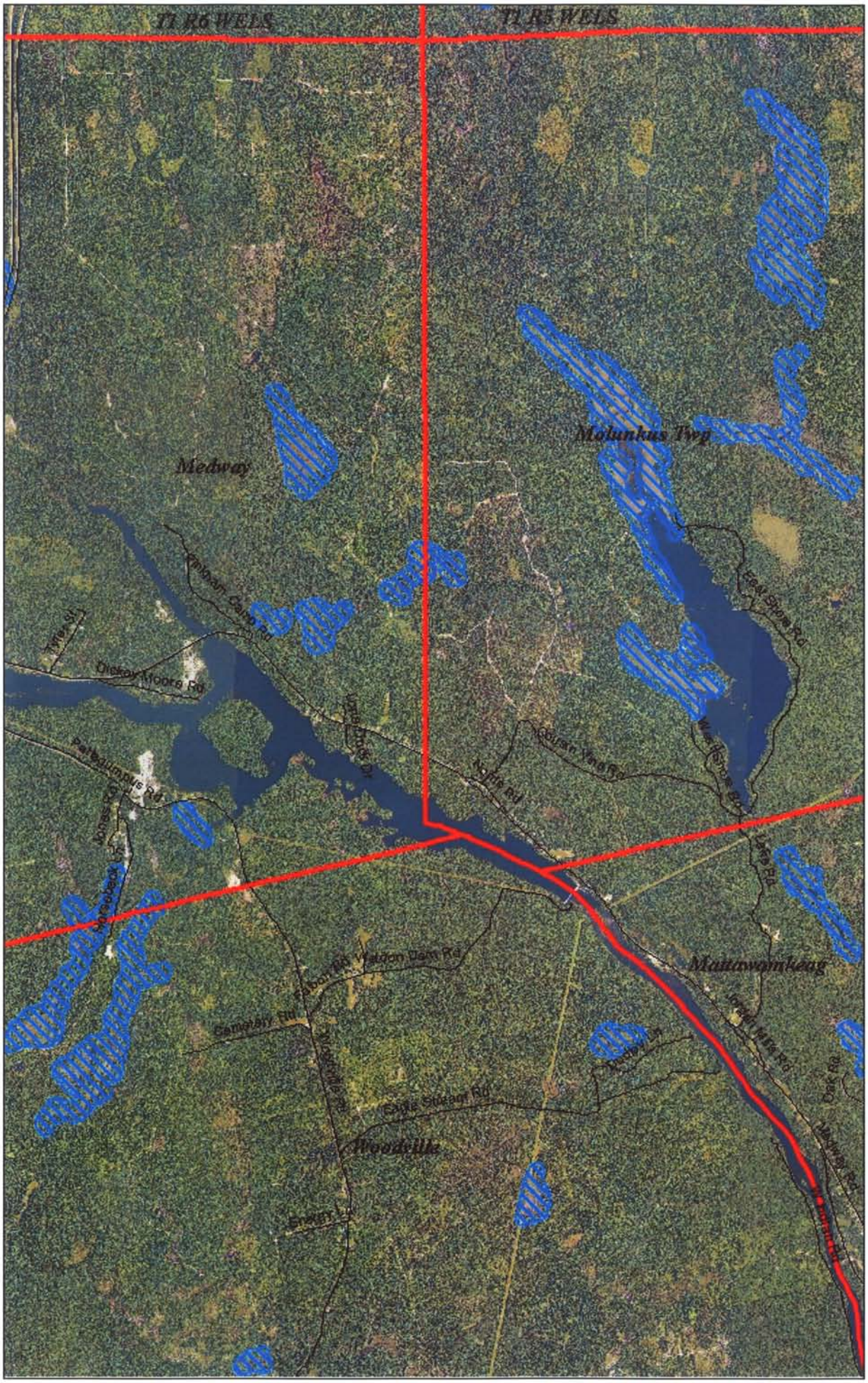


Map 27

Medway, ME

Streams and Wetlands

1:65,000
1 inch = 5,416.67 feet

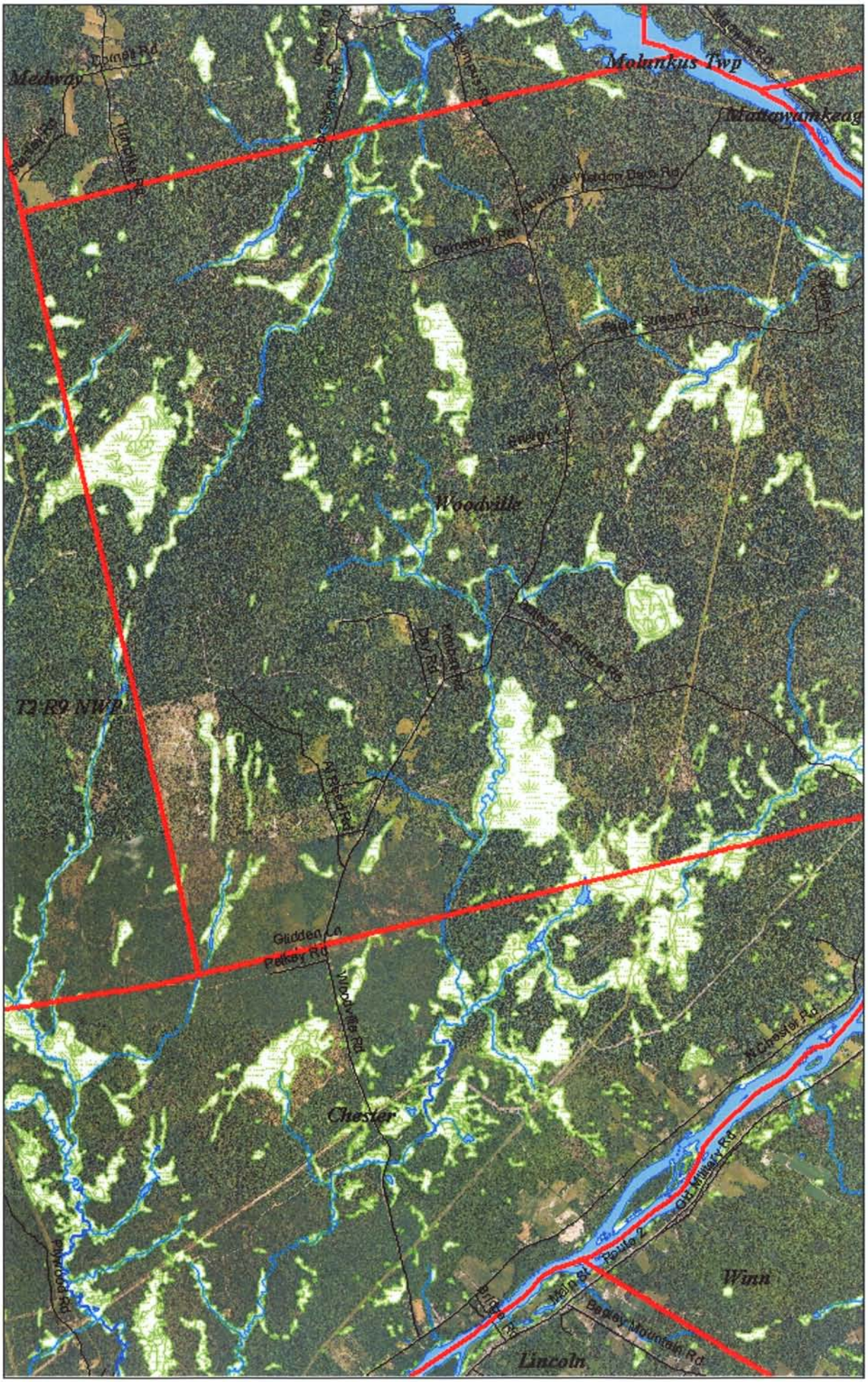


Map 28

Medway, ME

Inland Wading Bird Habitat

1:65,000
1 inch = 5,416.67 feet

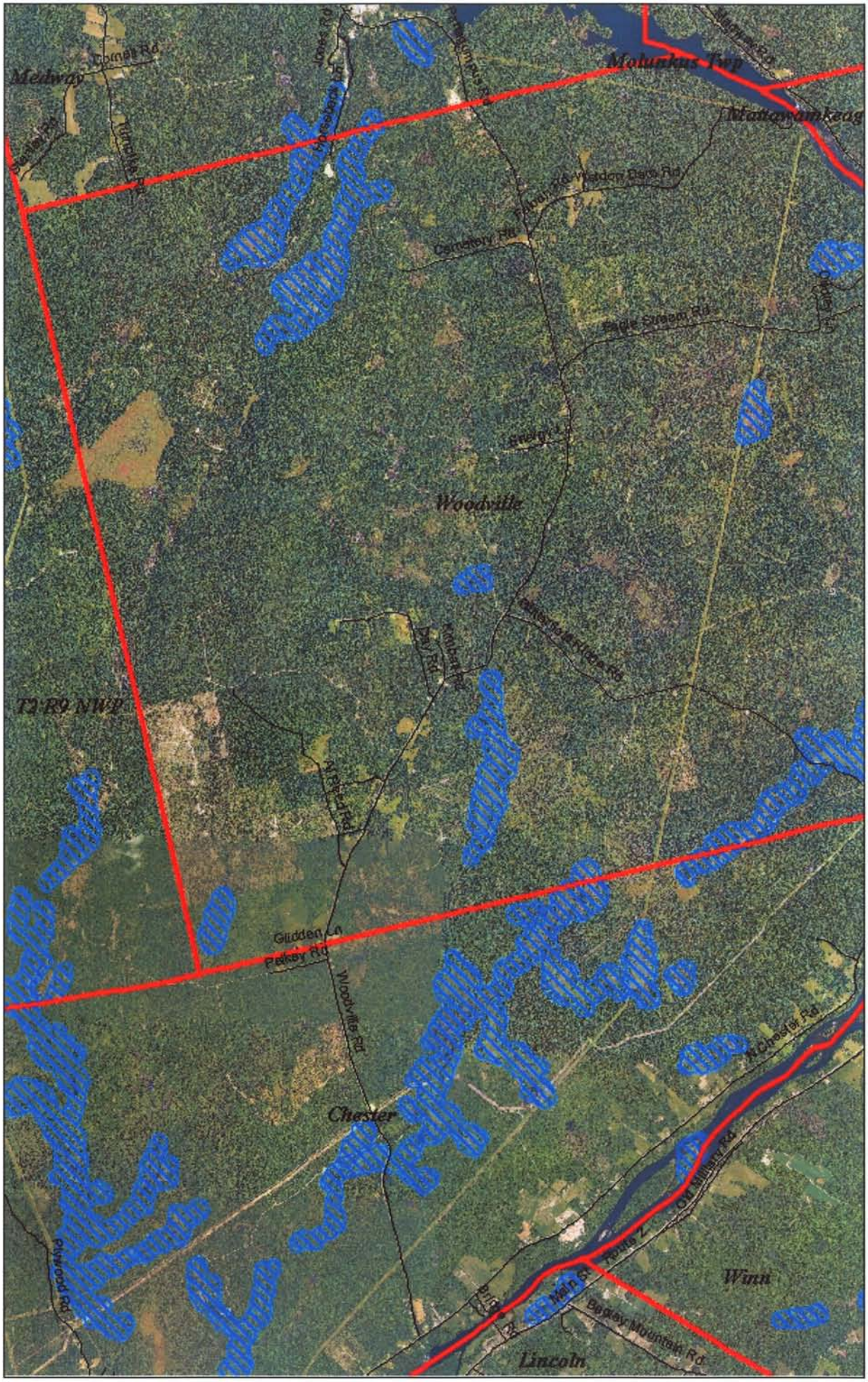


Map 29

Woodville T2R9, ME

Streams and Wetlands

1:65,000
1 inch = 5,416.67 feet

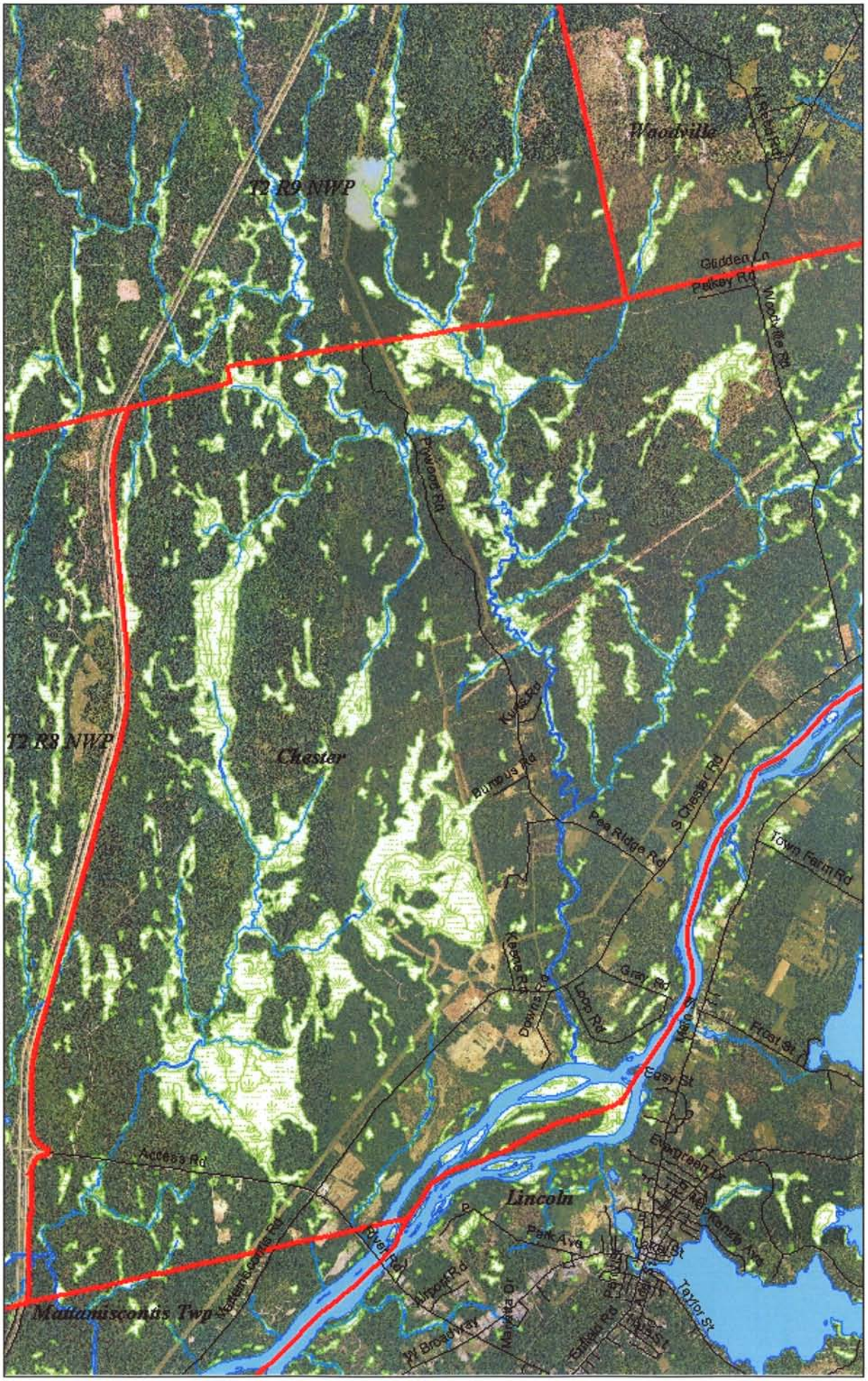


Map 30

Woodville T2R9, ME

Inland Wading Bird Habitat

1:65,000
1 inch = 5,416.67 feet

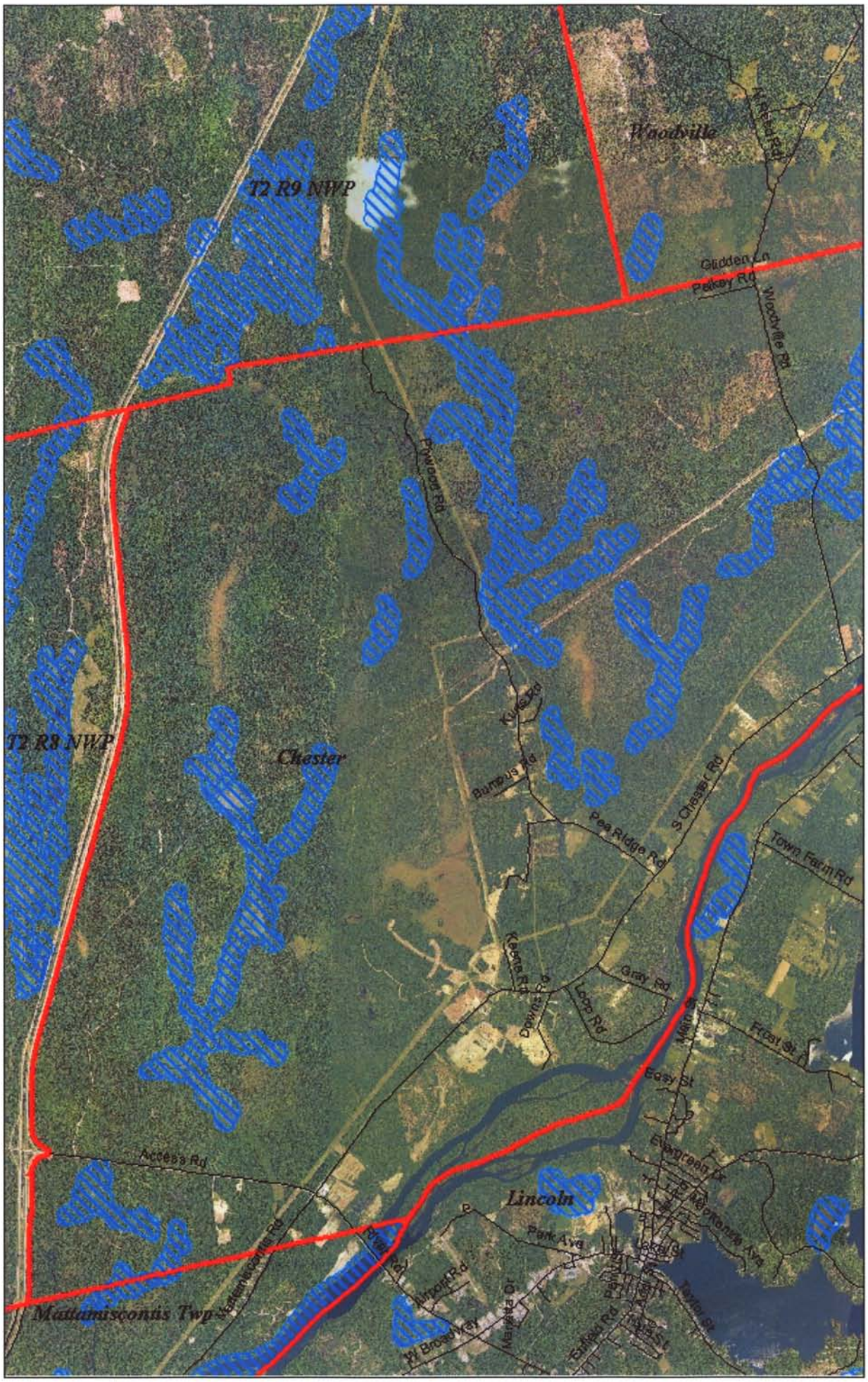


Map 31

Chester, ME

Streams and Wetlands

1:65,000
1 inch = 5,416.67 feet



Map 32

Chester, ME

Inland Wading Bird Habitat

1:65,000
1 inch = 5,416.67 feet

MAINE HISTORIC PRESERVATION COMMISSION
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04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

April 2, 2010

Mr. Brooke E. Barnes
Stantec Consulting
30 Park Drive
Topsham, ME 04086

Project: MHPC# 0464-10 - potential wind energy facility and associated transmission line routes; request for significant resources associated with Oakfield, Island Falls, Dyer Brook and other areas

Towns: Oakfield, Island Falls, Dyer Brook, T4 R3 Wels, ME

Dear Mr. Barnes:

In response to your recent request, I have reviewed the information received March 3, 2010 to initiate consultation on the above referenced project.

Based on the information provided, I have concluded that the project areas possibly contain one or more prehistoric and/or historic archaeological sites based on our predictive model of archaeological site location. Therefore, archaeological survey for both prehistoric and historic archaeology are necessary for the areas identified on the enclosed four maps (known archaeological sites and areas which may be sensitive for archaeological sites) prior to any ground disturbance. Lists of qualified historic and prehistoric archaeologists are enclosed along with material explaining the Phase I/II/III approach to archaeological survey. This information can also be found on our website: www.maine.gov/mhpc/project_review This office must approve any proposal for archaeological fieldwork.

Regarding above ground historic architectural resources, please forward maps which clearly indicate the Areas of Potential Effect (APE) for this project in order for us to respond properly to your request. As you know, we usually require some architectural survey for most wind projects and associated transmission lines in order to identify resources which are potentially eligible for listing in the National Register of Historic Places. Survey will need to be completed in accordance with our Section 106 specific architectural survey guidelines and associated forms.

It would be helpful for us to know early on what federal and state agencies will be involved with funding, permitting or licensing for this proposed project.

Once this information is received, we will forward a response regarding the results of our evaluation. Please contact Dr. Arthur Spiess of my staff concerning prehistoric archaeology, Lee Cranmer of my staff regarding historic archaeology or Robin Stancampiano of my staff regarding architecture if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
Deputy State Historic Preservation Officer

MAINE HISTORIC PRESERVATION COMMISSION
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AUGUSTA, MAINE
04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

Prehistoric Archaeologists Approved List: Review and Compliance Consulting/Contracting (Active)

LEVEL 1

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Dr Nathan Hamilton (207-780-5324)
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University of Southern Maine
Gorham ME 04038

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Edward Moore
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Ellsworth ME 04605
FAX: 207-667-0485

05/18/09

MAINE HISTORIC PRESERVATION COMMISSION
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JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

Historic Archaeologists Approved List: Review and Compliance Consulting/Contracting (Active)

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kwheeler@iac-llc.net

♦Underwater and Maritime

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
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AUGUSTA, MAINE
04333

ANGUS S. KING, JR.
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

CONTRACT ARCHAEOLOGY GUIDELINES

June 10, 2002

This document is provided as background information to agencies, corporations, professional consultants or individuals needing contract archaeological services (also known as Cultural Resources Management archaeology) in Maine. These guidelines are based on state rules (94-089 Chapter 812).

Project Types

The vast majority of contract archaeology survey work falls into one of three categories. **Phase I** surveys are designed to determine whether or not archaeological sites exist on a particular piece of land. Such work involves checking records of previous archaeology in the area, walking over the landscape to inspect land forms and look for surface exposures of soil and possible archaeological material, and the excavation of shovel test pits in areas of high probability. **Phase II** surveys are designed to focus on one or more sites that are already known to exist, find site limits by digging test pits, and determine site content and preservation. Information from Phase II survey work is used by the Maine Historic Preservation Commission (MHPC) to determine site significance (eligibility for listing in the National Register of Historic Places). **Phase III** archaeological work, often called data recovery, is careful excavation of a significant archaeological site to recover the artifacts and information it contains in advance of construction or other disturbance.

Archaeological sites are further divided into two broad categories of culture, **prehistoric** (or Native American), and **historic** (or European-American). Different archaeological specialists are usually needed for prehistoric or historic sites because the nature of content and preservation and site locations are quite different.

Scope of Work

In responding to a project submission, the MHPC may issue a letter specifying which type of archaeological survey is needed (prehistoric, historic or both) and at what level (Phase I, II, or III). Often the response letter contains further information, such as the suspected presence of an historic site of a certain age, or a statement that only a portion of the project parcel in question is sensitive for prehistoric sites and only that portion needs archaeological survey.

Once the project applicant has one or more scopes of work (proposals) from appropriate archaeologists (see below), the applicant should submit their preferred proposal *(without attached financial information or bid total)* to the MHPC for approval. MHPC will not comment upon cost, but will comment on the appropriateness of the scale and scope of the work. An approval from MHPC of the scope of work is the applicant's guarantee that, if the field and laboratory work are done according to the scope, and appropriately described in writing, the results will be accepted by MHPC.

The final written report on the project must also be submitted to MHPC for review and comment.

Finding an Archaeologist

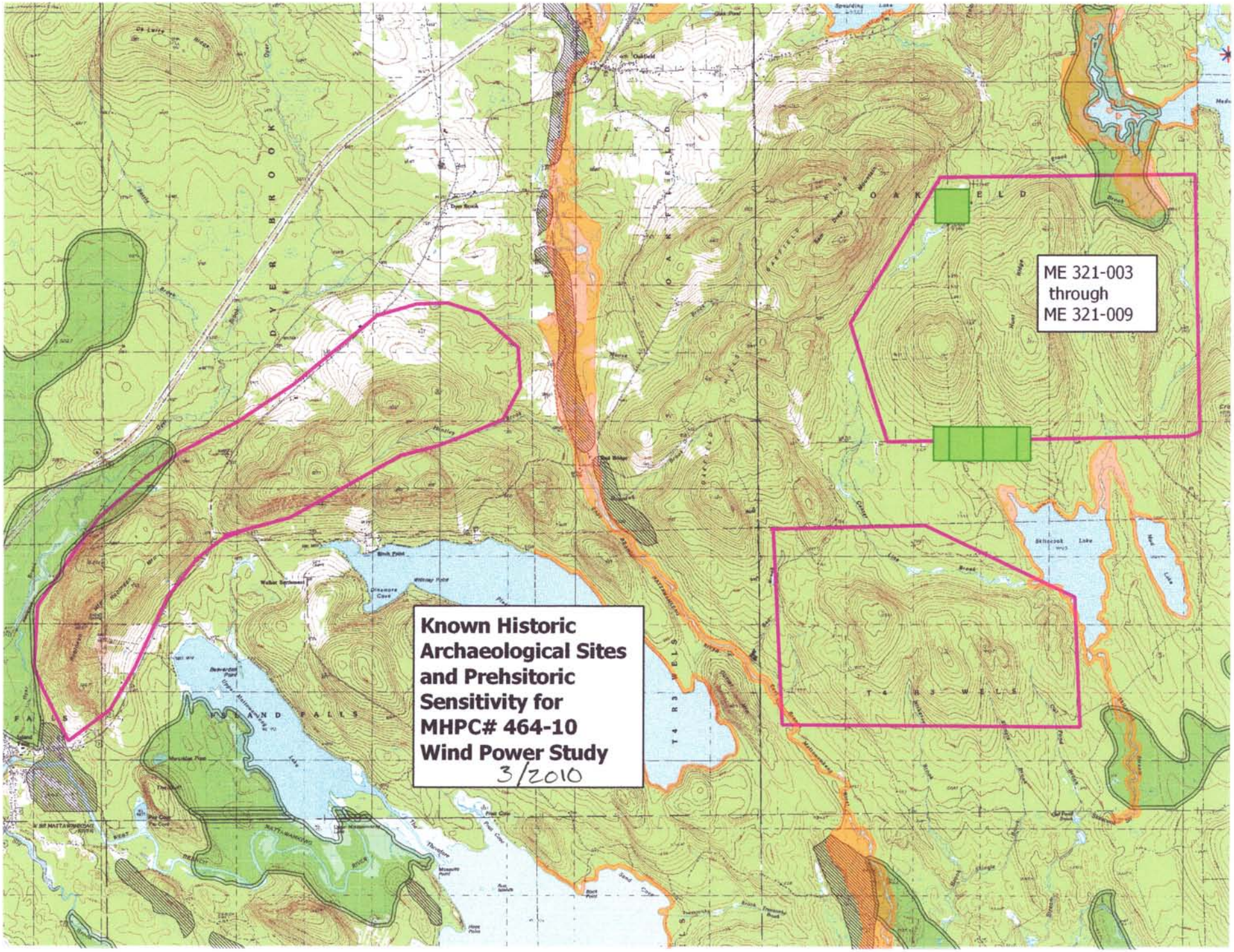
At the time that MHPC issues a letter requiring archaeological survey work, MHPC will also supply one (or more) lists of archaeologists (Levels 1 and/or 2, historic or prehistoric) appropriate to the type of work (Phase I, II, III, historic or prehistoric). Archaeologists on the Level 2 Approved Lists can do projects of any level, including Phase I archaeological survey projects. Level 1 archaeologists are restricted to doing Phase I surveys, and certain planning projects for municipal governments.

MHPC maintains lists of archaeologists interested in working in different geographic areas of Maine, and those who are qualified in different types of work. The archaeologists themselves indicate their availability (except for short-term absence) to MHPC on a periodic basis, so archaeologists on the list can be expected to respond to inquiries. The applicant should solicit proposals or bids for work from archaeologists whose names appear on the list supplied by MHPC.

These archaeologists' names are taken from lists of archaeologists approved for work in Maine by MHPC under a set of rules establishing minimal qualifications, such as previous supervisory experience in northern New England, and an appropriate graduate degree. *However, the inclusion of an archaeologist on one of these lists should not be interpreted as an endorsement by the MHPC beyond these limited qualification criteria. Moreover, the MHPC cannot recommend the services of an individual archaeologist.*

Project Final Report

Whatever the archaeological survey result, a final report on the project should be submitted by the applicant to the MHPC. The MHPC will review the report, and issue further guidance or issue a "clearance" letter for the project.


ME 321-003
through
ME 321-009
Known Historic
Archaeological Sites
and Prehsitoric
Sensitivity for
MHPC# 464-10
Wind Power Study
3/2010

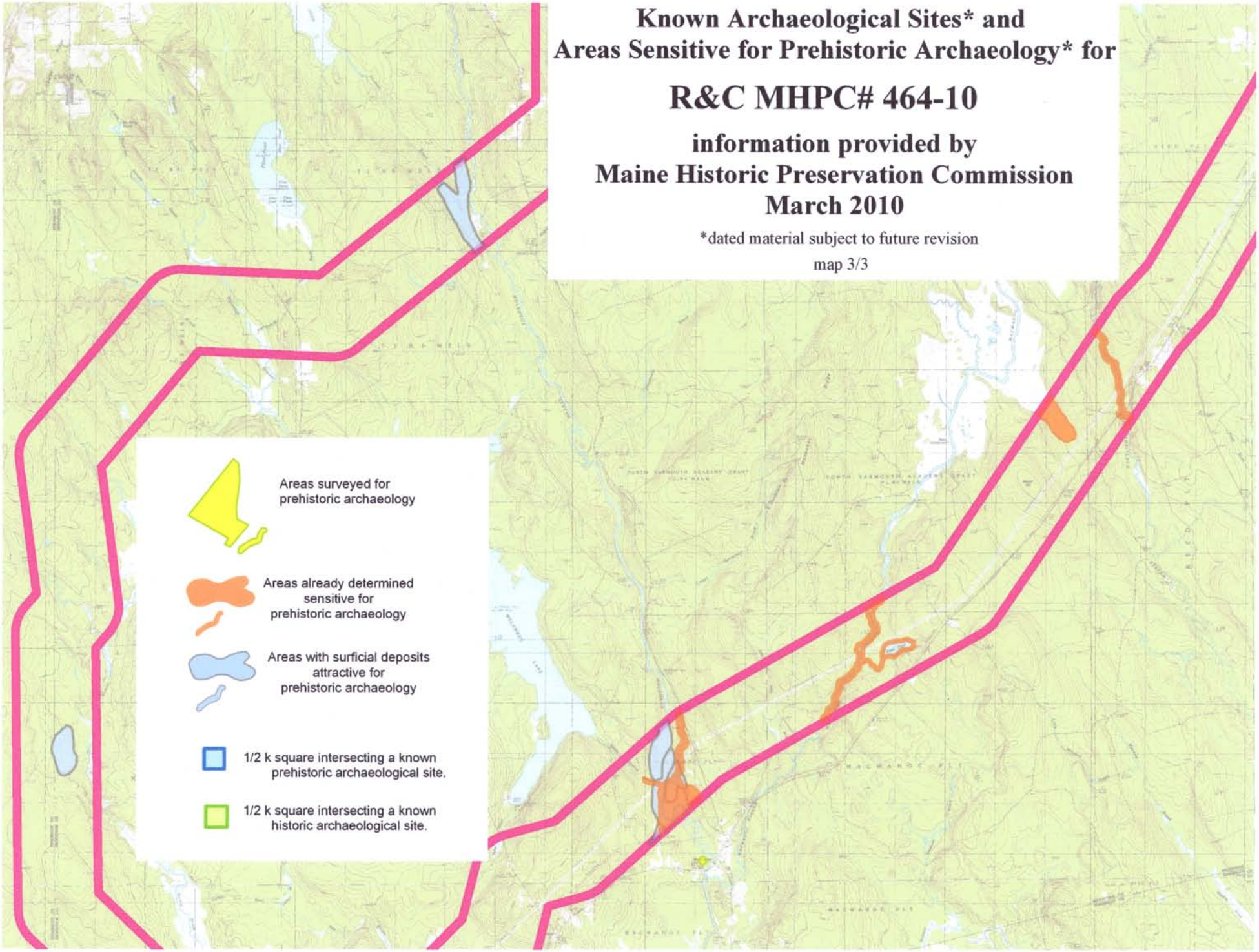
Known Archaeological Sites* and Areas Sensitive for Prehistoric Archaeology* for

R&C MHPC# 464-10

information provided by Maine Historic Preservation Commission March 2010

*dated material subject to future revision

map 3/3



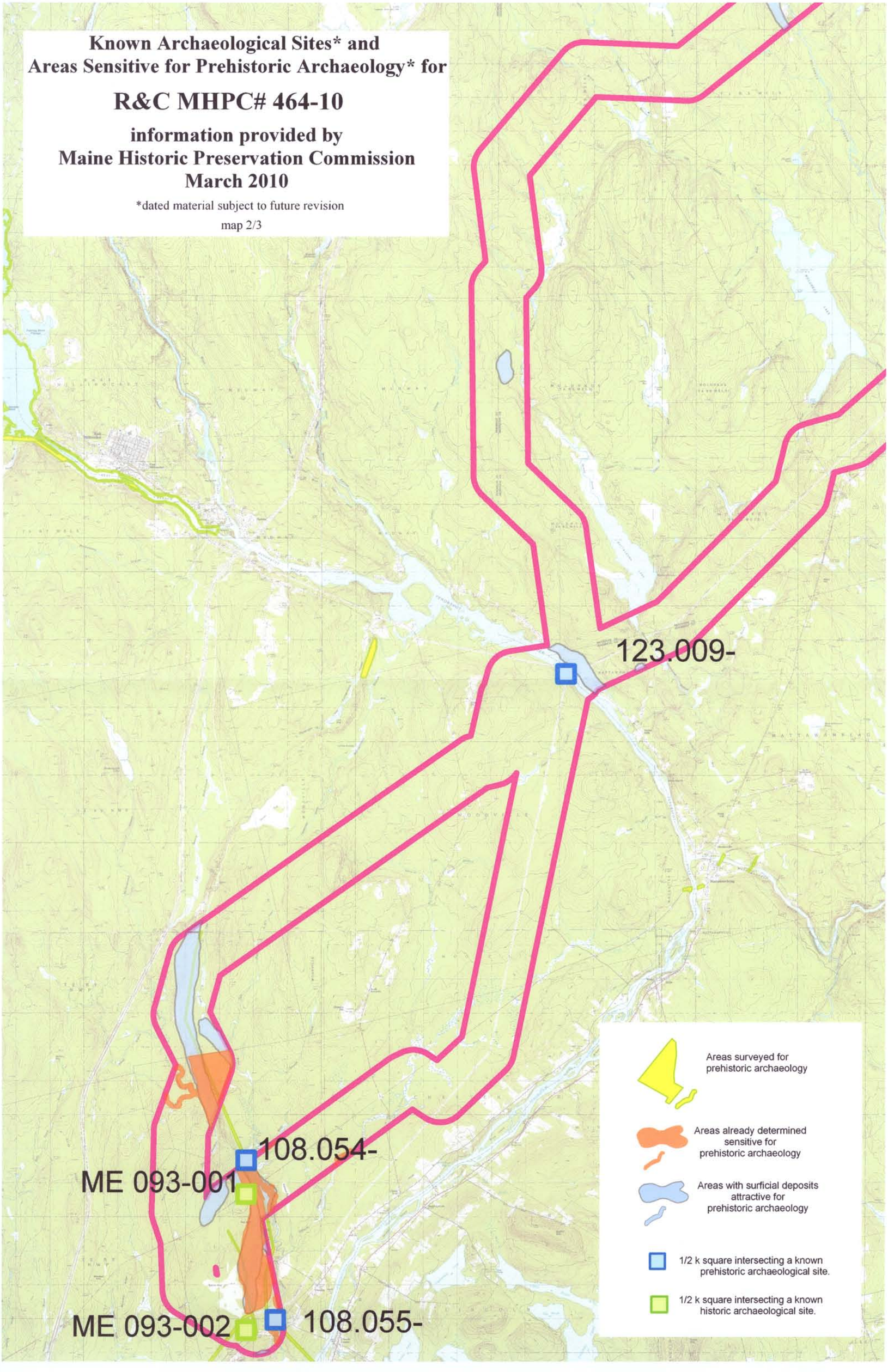
Known Archaeological Sites* and
Areas Sensitive for Prehistoric Archaeology* for

R&C MHPC# 464-10

information provided by
Maine Historic Preservation Commission
March 2010

*dated material subject to future revision

map 2/3



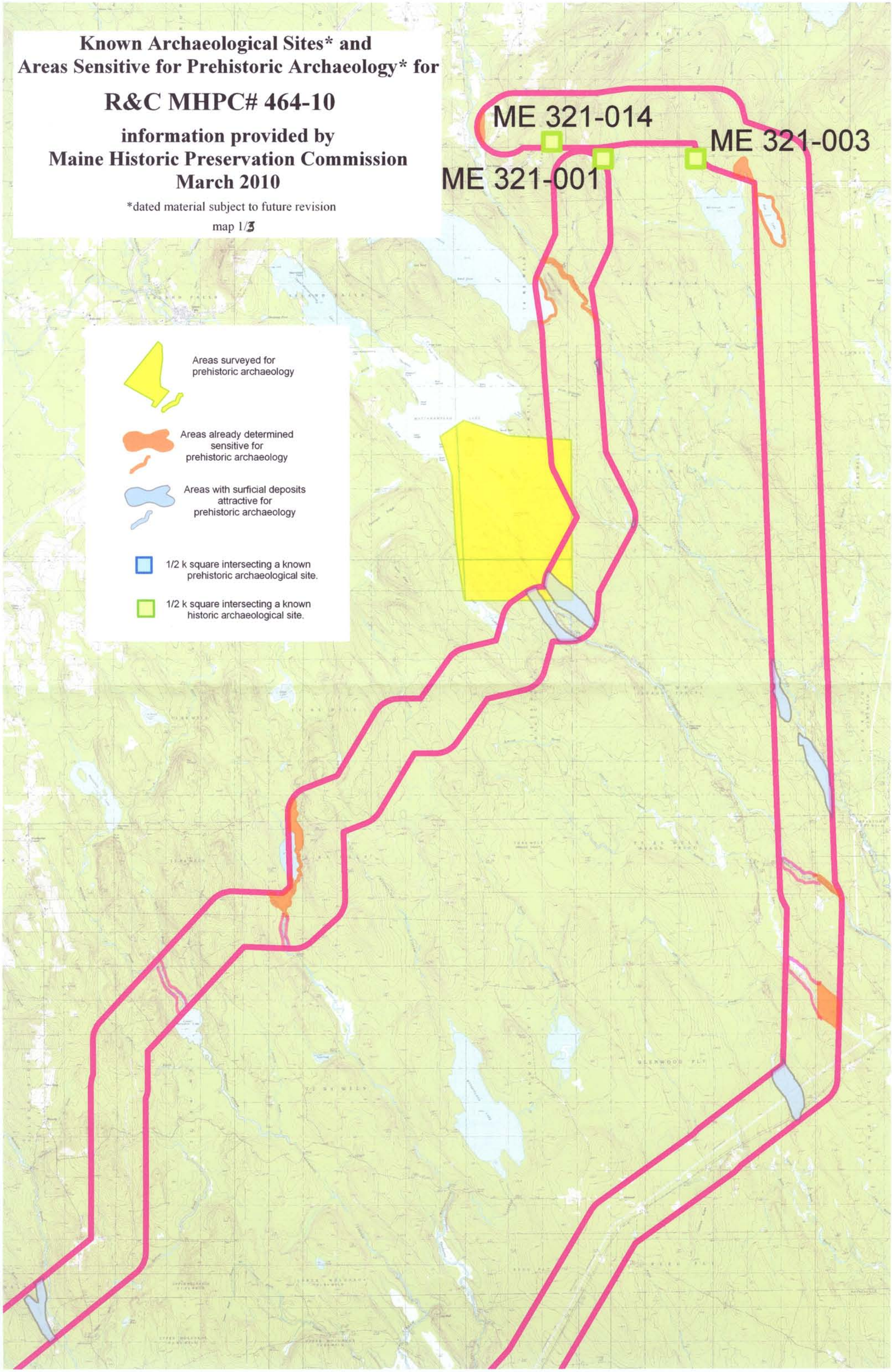
Known Archaeological Sites* and
Areas Sensitive for Prehistoric Archaeology* for

R&C MHPC# 464-10

information provided by
Maine Historic Preservation Commission
March 2010

*dated material subject to future revision

map 1/3



STATE OF MAINE
DEPARTMENT OF CONSERVATION
93 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0093

JOHN ELIAS BALDACCI
GOVERNOR

ELIZA TOWNSEND
COMMISSIONER

March 31, 2010

Brooke Barnes
Stantec Consulting
30 Park Drive
Tospham, ME 04086

Re: Rare and exemplary botanical features, Proposed Potential Transmission Lines and Wind Development Areas, Project 195600518, Chester to Oakfield, Maine.

Dear Mr. Barnes:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request of March 1, 2010 for information on the presence of rare or unique botanical features documented within 250 feet of the two proposed transmission line alignments and at the potential wind development sites in the area between the Towns of Chester and Oakfield, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. For certain types of projects, we also incorporate review of landscape analysis sites, which are areas determined to have a high potential to support significant natural features. Our review involves examining maps, manual and computerized records, aerial photography, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

This finding is for project scoping purposes only and should not be considered as a final review of the proposed project. When specific location options for facilities and/or transmission lines have been determined and updated environmental assessments have been completed, a subsequent review request should be submitted to us for recommendations regarding impacts to significant natural features prior to application submittal.

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

According to the information currently in our Biological and Conservation Data System files, there are several botanical features documented along the potential transmission line corridors and within the potential wind development area.

MAINE NATURAL AREAS PROGRAM
MOLLY DOCHERTY, DIRECTOR

PHONE: (207) 287-8044
FAX: (207) 287-8040
TTY: (207) 287-2213

Please refer to the table below and enclosed maps and fact sheets for more information about these features.

Specific commentary follows:

Hunt Ridge, Oakfield (Map 1). This site supports an exemplary Beech – Birch – Maple Forest. If wind infrastructure is planned within the natural community mapped here, please submit site plans for further commentary.

Dyer Brook and Robinson Mountain, Dyer Brook (Map 2). This site supports an exemplary Red Oak – Northern Hardwoods – White Pine Forest and a population of the rare plant Large Toothwort, *Cardamine maxima*. If wind infrastructure is planned within the natural community mapped here, please submit site plans for further commentary.

Table 1. Rare and Exemplary Botanical Features

Feature	Global Rank	State Rank	State Status	Occurrence Rank	Last Observed
Beech – Birch – Maple Forest (Map 1)	G3G5	S4	NA	Good	2004
Red Oak – Northern Hardwood Forest (Map 2)	GNR	S4	NA	Fair	2003
Large Toothwort, *Cardamine maxima* (Map 2)	G5	S1	Special Concern	Fair	2003
Streamshore Ecosystem (Map 3)		S4	NA	Good	2009
Small Yellow Water Crowfoot, *Ranunculus gmelinii* var. *purshii* (Map 3)	G5T5	S2	Threatened	Good	2008
Showy Lady's-slipper, *Cypripedium reginae* (Map 3)	G4	S3	Threatened	Good	2008
Marsh Valerian, *Valeriana uliginosa* (Map 3)	G4	S2	Special Concern	Good	2008
Swamp Fly-honeysuckle, *Lonicera oblongifolia* (Map 3)	G4	S3	Special Concern	Fair	2008
Northern Bog Sedge, *Carex gynocrates* (Map 3)	G5	S2	Special Concern	Good	2008
Eccentric Bog Ecosystem (Map 4)	GNR	S3	NA	Good	2007
Swarthy Sedge, *Carex adusta*(Map 5)	G5	S2	Endangered	Fair	1997

Alder Brook, Glenwood PLT (Map 3). This site supports an exemplary Streamshore Ecosystem and has indicators of enrichment. We recommend that you survey this area for rare calciphilic plant species.

Alder Brook Headwaters (Map 3). The rare plants at this site (Small Yellow Water Crowfoot, Showy Lady's-slipper, Marsh Valerian, Swamp Fly-honeysuckle, and Northern Bog Sedge) occur at the MEPCO Transmission Line, at the Headwaters of Alder Brook site, along the potential easterly alignment. Some accommodation should be made to provide continued survival of these populations at this site.

Flinn Pond, T1 R5 WELS and Benedicta TWP (Map 4). The potential westerly alignment (Greenfield Glenwood Options 090209) intersects the edge of an Eccentric Bog Ecosystem at this site. The transmission line as proposed poses no concerns and should not impact the ecosystem.

Horseback, Chester (Map 5). A single stem of the rare Swarthy Sedge, an early successional species, was found on the existing R.O.W. of the potential westerly alignment in 1997. The alignment as proposed is not a concern for this population.

Skitacook Stream Flats, T4 R3 WELS and Linneus (Map 6). The potential alignment in this area crosses the easterly edge of this landscape analysis site. We recommend that you survey the area for rare species in this area of the transmission line alignment.

Ebhorse Stream Bog, Woodville and Chester (Map 7). The potential alignment crosses through a landscape analysis site, however, we believe it is unlikely that any natural communities or ecosystems would be mapped at this site. We do, however, suggest botanical survey work where the northern white cedar grows on the northeast side.

Keene Bog, Chester (Map 8). This landscape analysis site has not been surveyed by MNAP and but we believe it has the potential for natural community mapping. The current alignment to the east of the existing easterly line (Oakfield T Line) is preferred. If the westerly alignment (Greenfield Glenwood Options 090209) is the preferred alignment, we suggest exploring options to move the line farther away from the bog on the southwest side of this site. Straightening the line by removing the last two angles before the terminus would sufficiently move the line from this bog.

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

Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

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

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $300.00 for our services.

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

Sincerely,

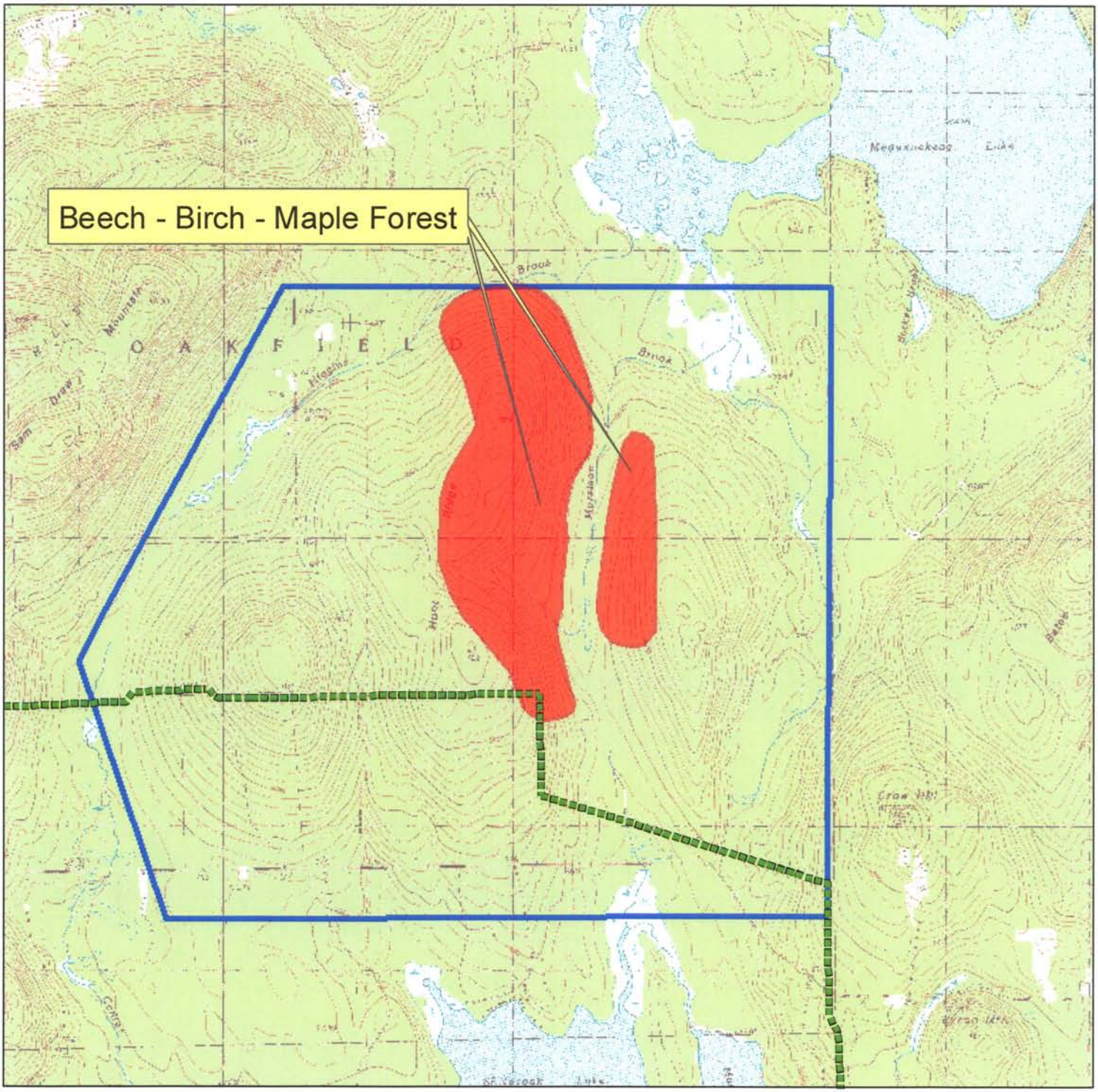
Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
207-287-8046

Lisa.St.Hilaire@maine.gov

Enclosures

Map 1. Hunt Ridge, Oakfield, Maine

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

Natural Community

Potential Tranmsission Line Oakfield T Line

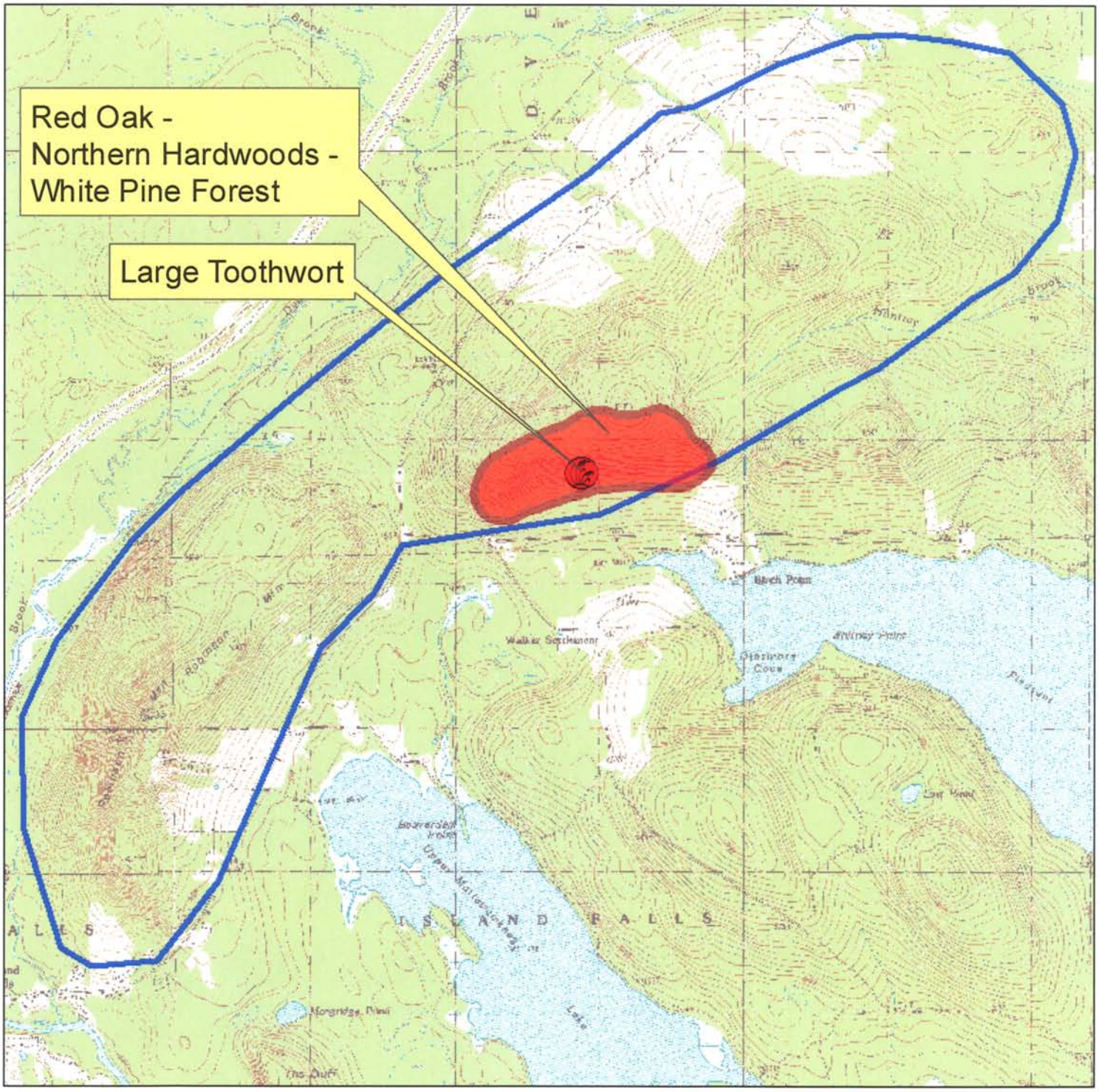
Approximate Project Boundary

0 0.2 0.4 0.8 1.2 1.6 Miles

Maine Natural Areas Program
March 2010

Map 2. Dyer Brook and Robinson Mountain, Dyer Brook, Maine

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

Rare Plant

Natural Community

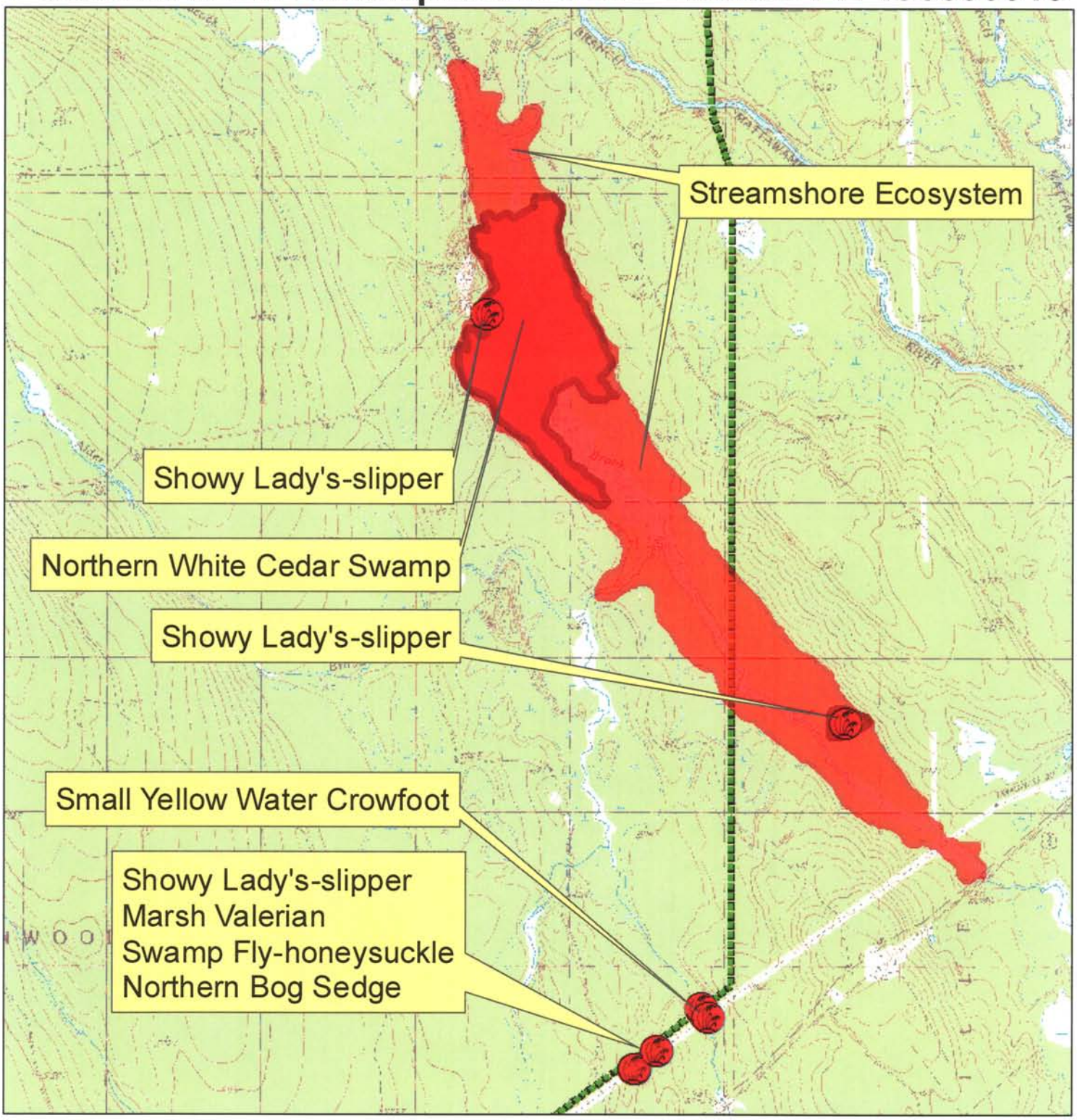
Approximate Project Boundary

0 0.150.3 0.6 0.9 1.2 Miles

Maine Natural Areas Program
March 2010

Map 3. Alder Brook and Alder Brook Headwaters, Haynesville, Glenwood PLT, T3 R3 WELS

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

Rare Plant

Natural Community

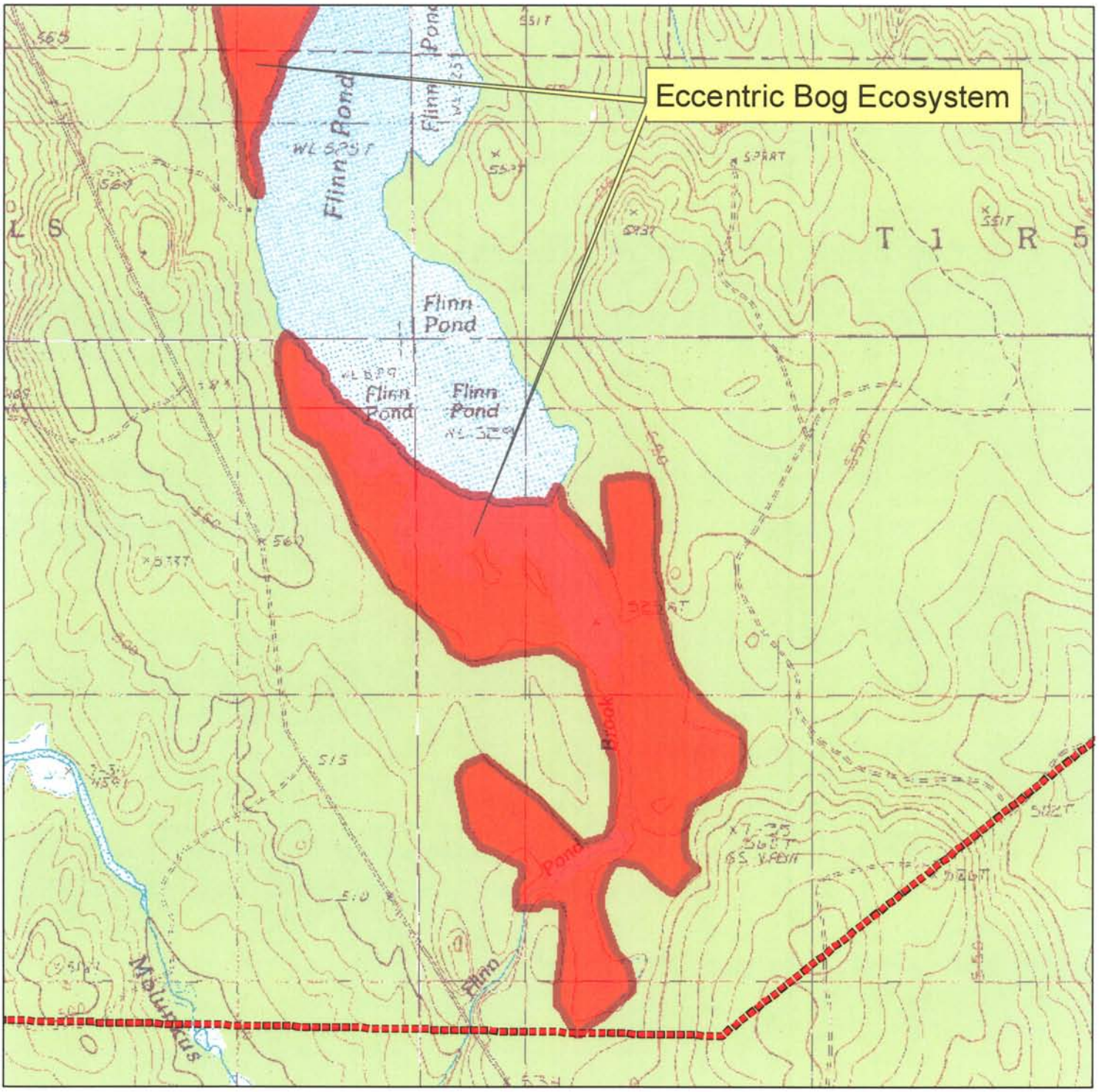
Potential Tranmsission Line Oakfield T Line

0 0.15 0.3 0.6 0.9 1.2 Miles

Maine Natural Areas Program
March 2010

Map 4. Flinn Pond, T1 R5 WELS, Maine

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



0 0.1 0.2 0.4 0.6 0.8 Miles

N

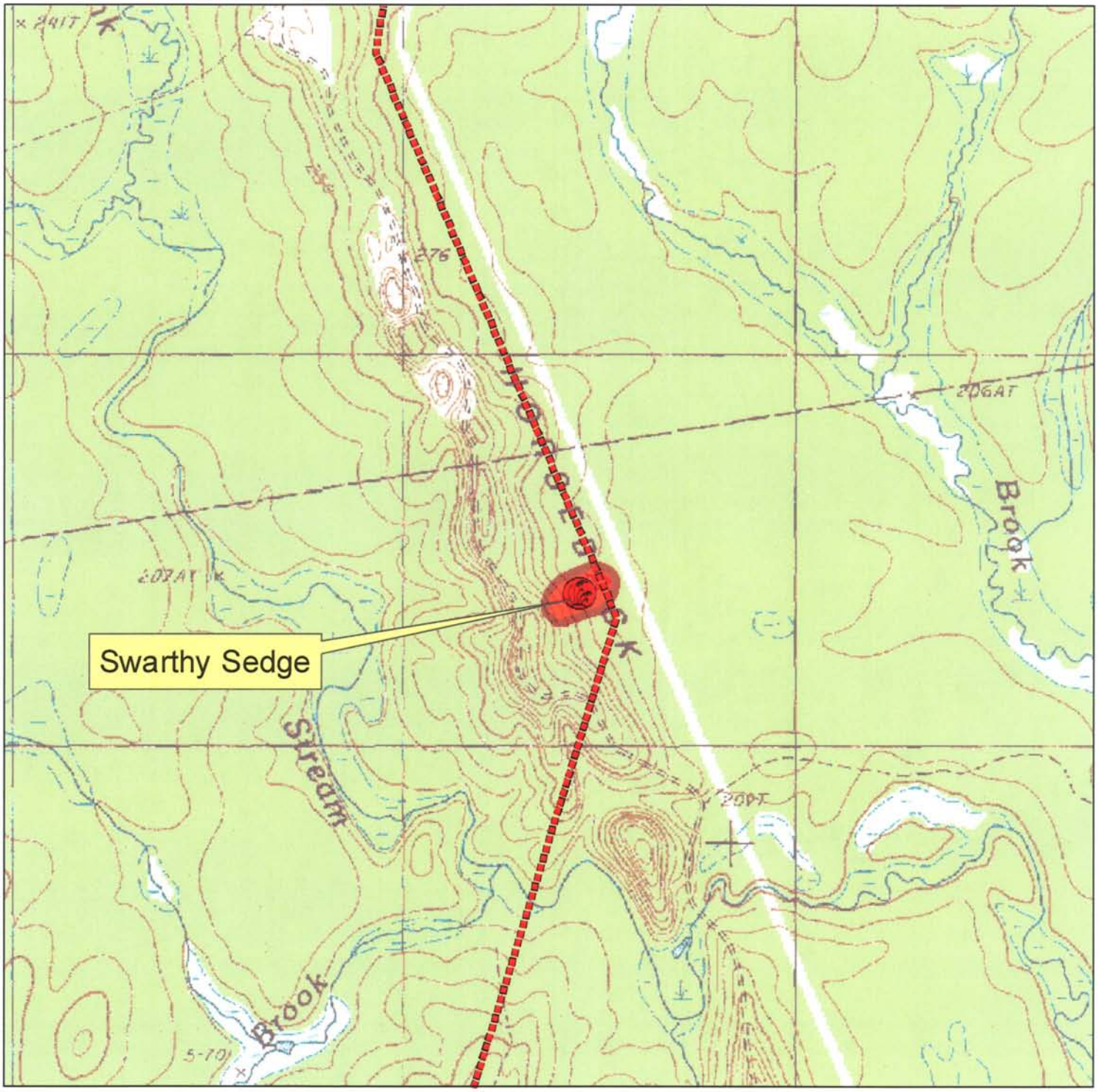
Natural Community

Potential Tranmsission Line Greenfield Glenwood

Maine Natural Areas Program
March 2010

Map 5. Horseback, Chester, Maine

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

0 0.125 0.25 0.5 0.75 1 Miles

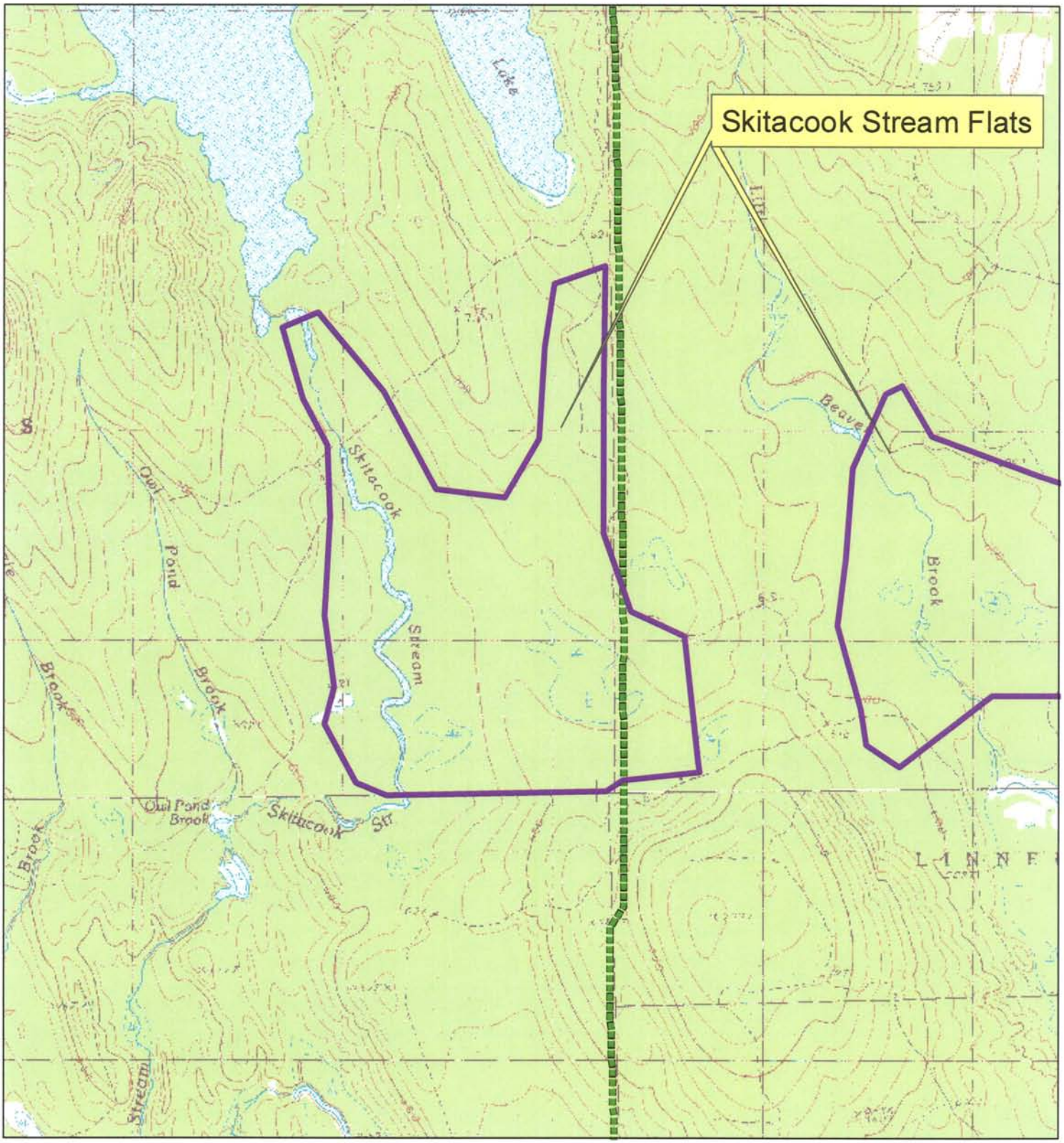
Rare Plant

Potential Tranmsission Line Greenfield Glenwood

Maine Natural Areas Program
March 2010

Map 6. Skitacook Stream Flats, T4 R3 WELS, Linneus

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

Landscape Analysis Site

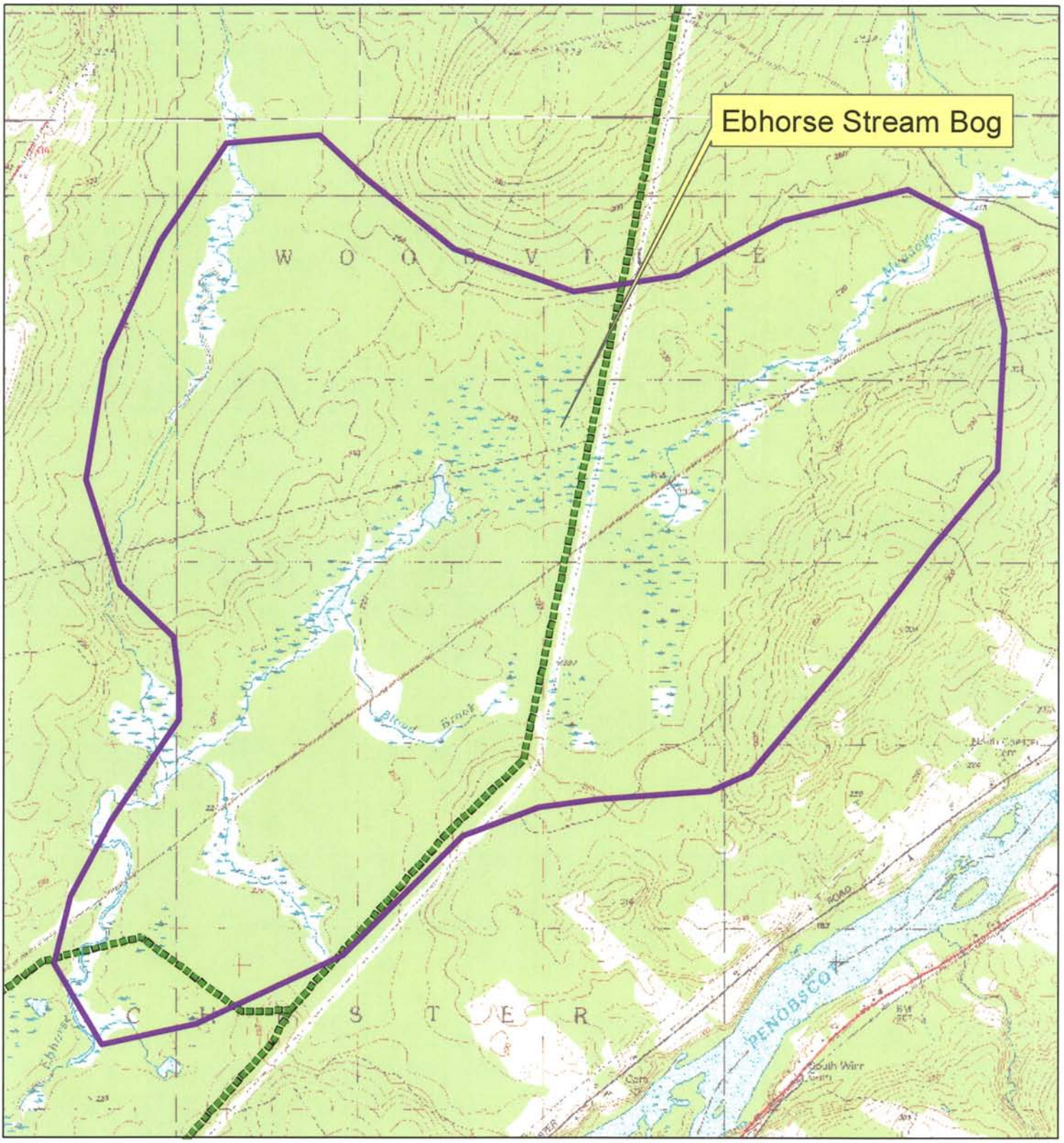
Potential Tranmsission Line Oakfield T Line

0 0.125 0.25 0.5 0.75 1 Miles

Maine Natural Areas Program
March 2010

Map 7. Ebhorse Stream Bog, Woodville and Chester

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

Landscape Analysis Site

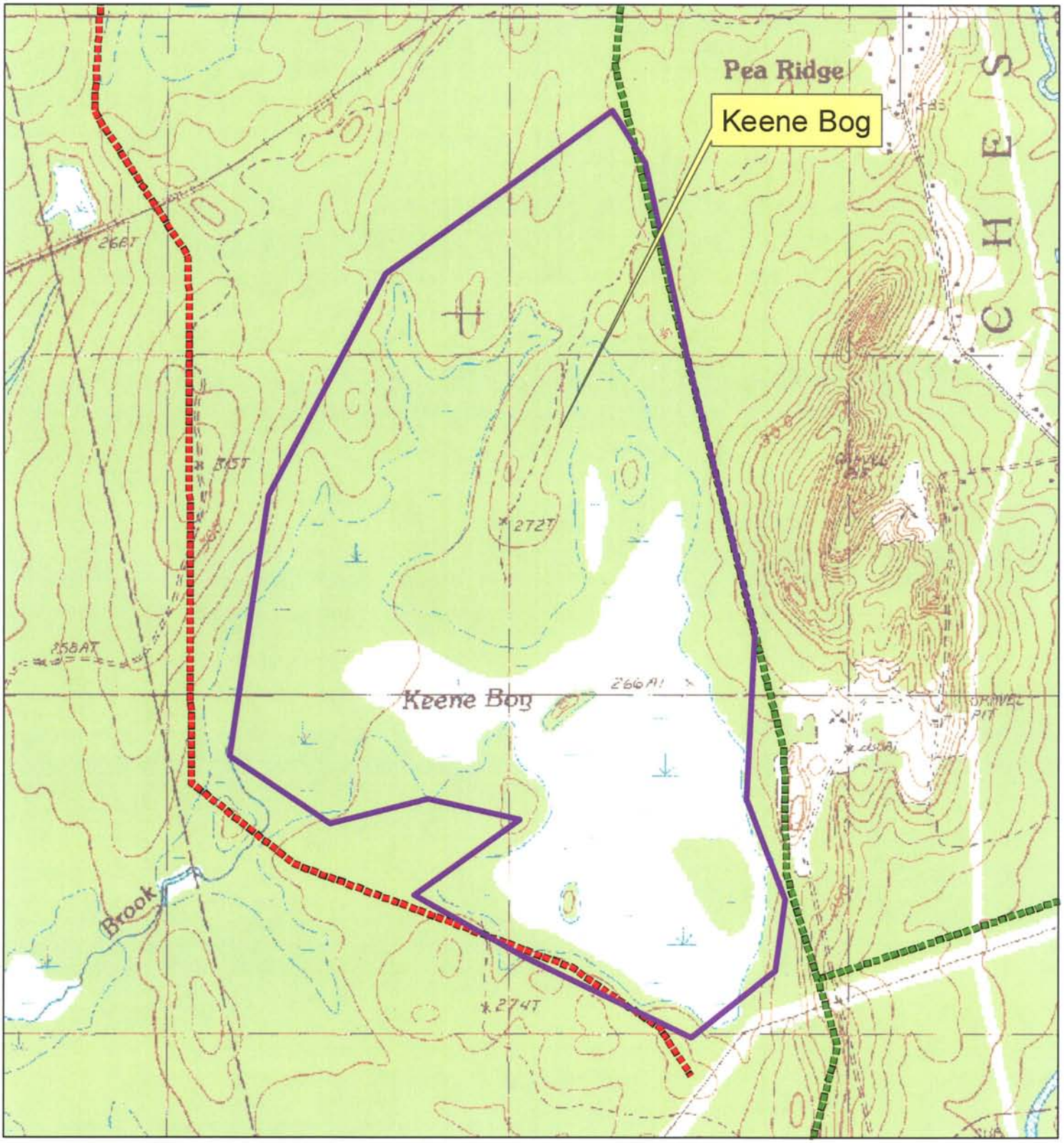
Potential Tranmsission Line Oakfield T Line

0 0.125 0.25 0.5 0.75 1 Miles

Maine Natural Areas Program
March 2010

Map 8. KeeneBog, Chester

Potential Transmission Line Corridors and Potential Wind Development Areas Stantec PN 195600518



N

Landscape Analysis Site

Potential Tranmsission Line Greenfield Glenwood

Potential Tranmsission Line Oakfield T Line

0 0.05 0.1 0.2 0.3 0.4 Miles

Maine Natural Areas Program
March 2010

Northern Hardwoods Forest

Beech - Birch - Maple Forest

State Rank S5

Community Description

These closed canopy forests are dominated by a combination of beech, yellow birch, and sugar maple. Paper birch, red maple, conifers, and red oak may be present at lower cover. Conifers and red oak can each have <25% cover. Striped maple is a common subcanopy tree. The variable shrub layer is dominated by tree regeneration. Cover, richness and composition vary with site conditions.

Soil and Site Characteristics

Sites are typically found on the lower to middle portion of hillslopes (slopes generally 10-50%). Soils are generally mesic and well drained, though not deep (typically 15-50 cm) silt loams to sandy loams to loamy sands formed over glacial till, with pH 5.0-5.6; some occur on stabilized talus. Elevations range up to 2000'.

Diagnostics

A combination of beech, sugar maple, and yellow birch distinguishes this type. Though red oak is often entirely absent, conifers and red oak can be present and have up to 25% cover each. The herb layer lacks rich site indicators such as Dutchman's breeches, maidenhair fern, and blue cohosh.

Diseased Beech Bark

Similar Types

Maple - Basswood - Ash Forests and Sugar Maple Forests are similar to, and often contiguous with, this type. In them, beech is far less abundant, white ash is usually well represented in the canopy, and the herb layer contains species indicative of rich-soil areas. Red Oak - Northern Hardwoods - White Pine Forests have a higher proportion of red oak and can have a higher proportion of conifers (>25%). Spruce - Northern Hardwoods Forests also have >25% conifers in the canopy.

Conservation, Wildlife, and Management Considerations

This is the dominant hardwood type in Maine, and therefore it is extensively harvested and managed. Most management techniques diverge from the natural gap pattern, which is at the scale of single trees or small groups of trees. Large (>1000 acres) examples reflecting only natural disturbance are scarce statewide, and intact examples in central and southern Maine tend to be smaller and more isolated.

Beech scale disease (Nectria) has devastated beech in many stands in eastern Maine. Although beech regenerates vigorously from sprouts after the trees have died, most sprouts succumb to the disease by the time they reach maturity. There are indications that some trees may express a genetic resistance to this disease.

Location Map

Northern Hardwoods Forest

Distribution

One of the predominant forest types in the New England - Adirondack Province and Laurentian Mixed Forest Province. Extends east, west, and north from Maine; occurs only as scattered areas southward.

Landscape Pattern: Matrix, typically hundreds of acres; high-quality patches usually now smaller.

American Beech with Beech Nuts

Characteristic Plants

These plants are frequently found in this community type. Those with an asterisk are often diagnostic of this community.

Canopy

American beech*
Eastern hemlock*
Paper birch*
Sugar maple*
Yellow birch*

Sapling/shrub

American beech*
Hobblebush*
Striped maple*
Sugar maple*
Yellow birch*

Herb

Bluebead lily*
Canada mayflower
Shining clubmoss*
Starflower
Striped maple*
Sugar maple*

Associated Rare Plants

Autumn coral-root
Boreal bedstraw
Broad beech fern
Cut-leaved toothwort
Nodding pogonia
Tall white violet

Associated Rare Animals

Early hairstreak

Examples on Conservation Lands You Can Visit

- Baxter State Park - Piscataquis Co.
- Big & Little Squaw Mountain Public Lands - Piscataquis Co.
- Bigelow Preserve Public Lands - Franklin/Somerset Co.
- Deboullie Ponds Public Lands - Aroostook Co.
- Grafton Notch State Park & Mahoosuc Public Lands - Oxford Co.
- White Mountain National Forest - Oxford Co.

Maine Department of Conservation
Natural Areas Program

Carex adusta Boott

Swarthy Sedge

Habitat: Dry, open places. [Rocky coastal (non-forested, upland)]

Range: Newfoundland south to New Brunswick, Maine and northern New York, west to Michigan, Minnesota, and British Columbia.

Phenology: Fruits July - September.

Family: Cyperaceae

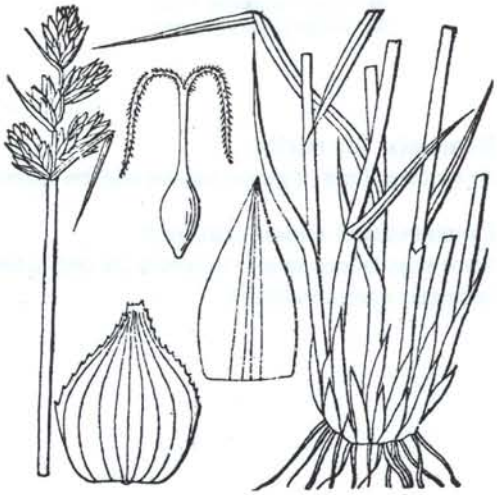


Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Aids to Identification: Identification of species of the genus *Carex* is usually difficult and dependent upon rather technical characters. *C. adusta* is in the section *Ovales* and it is distinguished by the following characteristics: densely tufted growth; lower leaves are merely scales; 4-15 spikes are crowded into a cluster 2-3 cm long; perigynia are 4.2-5.2 mm long and half as wide, with fine dorsal nerves; floral scales as long as the peryginia; upper portion of the leaf sheath is smooth, lacking minute papillae.

Ecological characteristics: Known to occur in Maine on sandy roadsides and disturbed, dry clearings. This is a pioneer species of open areas that have been recently disturbed by fire or mechanical means, so that mineral soil is exposed. In Maine, it seems to be most common in the coastal region.

Synonyms:

Rarity of *Carex adusta*

State Rank:	S2	Imperiled in Maine because of rarity or vulnerability to further decline.
New England Rank:	Division 2	Regionally rare plant: Fewer than 20 current (seen since 1970) occurrences within New England.
Global Rank:	G5	Demonstrably widespread, abundant, and secure globally.

Status of *Carex adusta*

Federal Status:	None	No Federal Status.
State Status:	Endangered	Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered. Listing criteria met: Few individuals, At edge of range, Declining populations, Vulnerable to human activity

▲ Historical (before 1982)
● Recent (1982 - present)

Known Distribution in Maine:

This rare plant has been documented from a total of 14 town(s) in the following county(ies): Aroostook, Franklin, Hancock, Knox, Penobscot, Washington.

Dates of documented observations are: 1883, 1890, 1891 (2), 1897, 1898, 1899 (2), 1914, 1916, 1949, 1988, 1991 (3), 1995 (2), 1997 (3), 1999, 2000 (2), 2002

Reason(s) for rarity:
At southern limit of range; habitat may be ephemeral.

Conservation considerations:
Some populations appear to persist for only a few years. All occur in locations where natural or artificial disturbance maintains open conditions.

Plant rarity and status is based on 2008 data and the rest of the information in this fact sheet was downloaded from the Natural Areas Program's Biological and Conservation Database on 06 MAY 2004. We are grateful to our Botanical Advisory Group for additional information on particular species, and in particular, to Arthur Haines for his assistance with identifying characteristics and taxonomic questions. Nomenclature follows Haines and Vining's *Flora of Maine* (V.F. Thomas Press, 1998); where older works refer to a plant by another name, it is given under "Synonyms". The Natural Areas Program, within the Department of Conservation, maintains the most comprehensive source of information on Maine's rare or endangered plants and rare or exemplary natural communities, and is a member of the Association for Biodiversity Information.

If you know of locations for this plant or would like more information on this species,
please contact the Natural Areas Program
State House Station 93, Augusta, Maine 04333; telephone (207) 287-8044.

DEPARTMENT OF CONSERVATION
MAINE

Maine Department of Conservation
Natural Areas Program

Carex gynocrates Wormsk. ex Drej.

Northern Bog Sedge

Habitat: Peaty soils, often with circumneutral pH. [Conifer forest (forest, upland); Forested wetland]

Range: Circumboreal, south to Pennsylvania, Michigan, Minnesota, and Utah.

Phenology: Fruits June - August.

Family: Cyperaceae

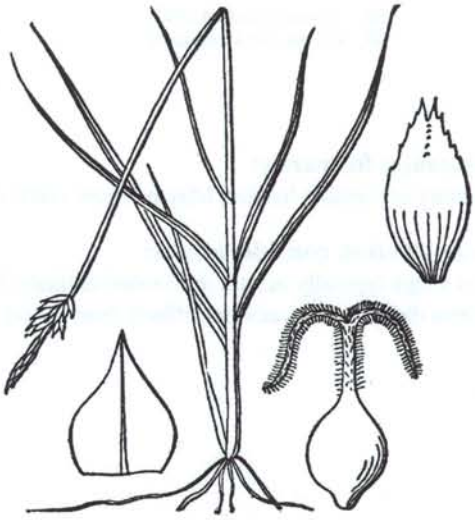


Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Aids to Identification: Identification of species of the genus *Carex* is usually difficult and dependent upon rather technical characters. *C. gynocrates* is the only member of the section *Dioicae* in this region. It is identified by its loosely rhizomatous growth, lenticular achenes, slender leaves (1mm wide), solitary spike, and ovoid perigynia, 3-3.5mm long.

Ecological characteristics: This sedge is often found in association with Northern White Cedar fens in Maine.

Synonyms: Sometimes placed as subspecies *gynocrates* in the circumboreal taxon *C. dioica* (Gleason and Cronquist second ed., 1991), but separated by most authors as a distinct species.

Rarity of *Carex gynocrates*

State Rank:	S2	Imperiled in Maine because of rarity and vulnerability to further decline.
New England Rank:	INDT	Indeterminate. Under review for inclusion in appropriate division. Taxonomy, nomenclature, or status not clearly understood.
Global Rank:	G5	Demonstrably widespread, abundant, and secure globally.

Status of *Carex gynocrates*

Federal Status:	None	No Federal Status.
State Status:	Scecial Concern	
Proposed State Status:	Special Concern	Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

▲ Historical (before 1983)
● Recent (1983 - present)

Known Distribution in Maine:

This rare plant has been documented from a total of 11 town(s) in the following county(ies): Aroostook, Penobscot, Piscataquis.

Dates of documented observations are: 1898, 1984, 1987, 1989 (2), 1990, 1991, 1993, 2001 (2), 2002, 2003

Reason(s) for rarity:
Scarcity of suitable habitat. May be more common than records indicate.

Conservation considerations:
This sedge typically occurs in forested habitats. Effects of logging are unknown, but partial removal of the canopy would be less likely to have adverse effects than would complete removal of the canopy.

The information in this fact sheet was downloaded from the Natural Areas Program's Biological and Conservation Database on 06 MAY 2004. We are grateful to our Botanical Advisory Group for additional information on particular species, and in particular, to Arthur Haines for his assistance with identifying characteristics and taxonomic questions. Nomenclature follows Haines and Vining's *Flora of Maine* (V.F. Thomas Press, 1998); where older works refer to a plant by another name, it is given under "Synonyms". The Natural Areas Program, within the Department of Conservation, maintains the most comprehensive source of information on Maine's rare or endangered plants and rare or exemplary natural communities, and is a member of the Association for Biodiversity Information.

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DEPARTMENT OF CONSERVATION
MAINE

Maine Department of Conservation
Natural Areas Program

Cypripedium reginae Walt.

Showy Lady's-slipper

Habitat: Circumneutral peatlands (often at edges) or sunlit openings of mossy woods. [Forested wetland; Open wetland, not coastal nor rivershore (non-forested, wetland)]

Range: Newfoundland to North Dakota and Manitoba, south in Appalachians to Georgia.

Phenology: In Maine flowers late June to July.

Family: Orchidaceae

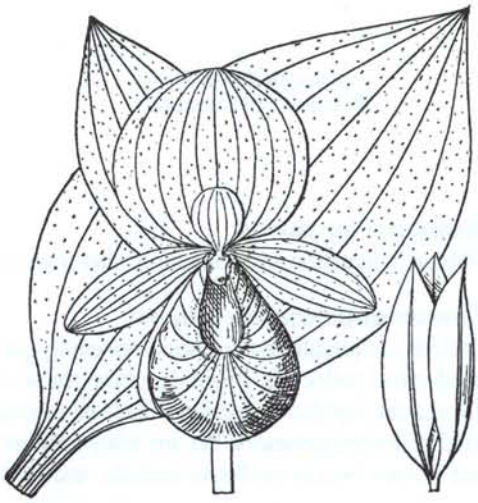

Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Aids to Identification: The largest and showiest of our lady's-slippers. Foliage of non-flowering plants emerging in early spring may be mistaken for false hellebore. Flowering plants are unique with their tall leafy stems bearing one or two large flowers with white petals and sepals contrasting with magenta pink pouch. Densely pubescent throughout, the hairs may cause a rash similar to poison ivy.

Ecological characteristics: Showy lady's-slippers apparently require constant moisture, some sunlight and circumneutral soil conditions. In acid bogs their roots go under the acid *Sphagnum* to more neutral groundwater below. In clearings or woods edges colonies may be very large and flowering abundant, but plants in deep shade often lack flowers. *C. reginae* seeds seem to germinate best at depths of at least 5 cm. It has been suggested that this may account for the presence of dense colonies in deer yards where the deer hooves may help to push seeds to the appropriate depth. *C. reginae* takes about 15 years to reach flowering age, which explains why they are slow to reappear after colonies have been dug up.

Synonyms: Formerly known as *Cypripedium spectabile* Salisb.

Rarity of *Cypripedium reginae*

State Rank:	S3	Rare in Maine.
New England Rank:	None	
Global Rank:	G4	Widespread, abundant, and apparently secure globally, but with cause for long-term concern.

Status of *Cypripedium reginae*

Federal Status:	None	No Federal Status.
State Status:	Threatened	Rare and, with further decline, could become endangered; or federally listed as Threatened. Listing criteria met: Declining populations, Vulnerable to human activity

σ Historical (before 1983)
● Recent (1983- present)

Known Distribution in Maine:

This rare plant has been documented from a total of 52 town(s) in the following county(ies): Androscoggin, Aroostook, Cumberland, Hancock, Kennebec, Knox, Oxford, Penobscot, Piscataquis, Somerset, Washington.

Dates of documented observations are: 1874, 1880, 1889 (2), 1891, 1896, 1903, 1904, 1906, 1907 (2), 1908, 1910 (3), 1914, 1924, 1925, 1935, 1940 (2), 1943, 1950, 1978, 1981 (6), 1982, 1983 (3), 1984, 1985, 1989 (3), 1990 (4), 1991, 1992, 1993, 1995, 1997, 1998 (3), 19XX (2), 2000 (2), 2001 (2), 2002 (6)

Reason(s) for rarity:

Habitat destruction and collecting, also scarcity of suitable habitat.

Conservation considerations:

Orchids are popular among some speciality gardeners, and populations of this species are vulnerable to unscrupulous or uneducated collectors. Plants dug from the wild usually do not survive; more importantly, removing these plants harms the natural population and may cause its eventual disappearance. Tissue-culture propagation of this species has been tried in limited instances, but any plants offered for sale have almost certainly been dug from the wild. This orchid grows and flowers best in moderate sunlight, and partial removal of the canopy can benefit the populations, if done correctly.

Plant rarity and status is based on 2008 data and the rest of the information in this fact sheet was downloaded from the Natural Areas Program's Biological and Conservation Database on 29 APR 2004. We are grateful to our Botanical Advisory Group for additional information on particular species, and in particular, to Arthur Haines for his assistance with identifying characteristics and taxonomic questions. Nomenclature follows Haines and Vining's *Flora of Maine* (V.F. Thomas Press, 1998); where older works refer to a plant by another name, it is given under "Synonyms". The Natural Areas Program, within the Department of Conservation, maintains the most comprehensive source of information on Maine's rare or endangered plants and rare or exemplary natural communities, and is a member of the Association for Biodiversity Information.

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DEPARTMENT OF CONSERVATION
MAINE

Maine Department of Conservation
Natural Areas Program

Lonicera oblongifolia (Goldie) Hook.

Swamp Fly-honeysuckle

Habitat: Bogs, swampy thickets and wet woods. [Forested wetland; Open wetland, not coastal nor rivershore (non-forested, wetland)]

Range: New Brunswick and Quebec to Manitoba, New York, Pennsylvania, Michigan and Minnesota.

Phenology: Flowers May - June.

Family: Caprifoliaceae

Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Aids to Identification: Swamp fly-honeysuckle is a shrub that grows up to 1.5 m high with upward pointing branches covered with small hairs, and opposite oval leaves 2-5 cm in length. The flowers, borne in pairs, are yellow, two-lipped, and narrow. The fleshy red berries also occur in pairs. The only other honeysuckle that is found in similar communities is *Lonicera villosa*, the mountain fly honeysuckle. It is distinguished by its blue berries and winter buds covered by 2 valvate scales (vs. several imbricate scales).

Ecological characteristics: Because of the specific habitat requirements of swamp fly-honeysuckle -- open areas of cool cedar swamps underlain by limestone -- it is not widespread, but populations may be plentiful where it does occur.

Synonyms:

Rarity of *Lonicera oblongifolia*

State Rank:	S3	Rare in Maine.
New England Rank:	None	
Global Rank:	G4	Widespread, abundant, and apparently secure globally, but with cause for long-term concern.

Status of *Lonicera oblongifolia*

Federal Status:	None	No Federal Status.
State Status:	Special Concern	Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

▲ Historical (before 1983)
● Recent (1983 - present)

Known Distribution in Maine:

This rare plant has been documented from a total of 25 town(s) in the following county(ies): Aroostook, Penobscot, Piscataquis, Somerset, Washington.

Dates of documented observations are: 1883 (2), 1937, 1938 (2), 1941, 1945, 1983, 1984, 1985, 1986, 1987, 1988, 1989 (2), 1993 (4), 1994, 1997, 2001 (2), 2002 (5), 2003 (2)

Reason(s) for rarity:
Specific habitat requirements.

Conservation considerations:
Appears reasonably secure; known populations are persistent.

The information in this fact sheet was downloaded from the Natural Areas Program's Biological and Conservation Database on 13 MAY 2004. We are grateful to our Botanical Advisory Group for additional information on particular species, and in particular, to Arthur Haines for his assistance with identifying characteristics and taxonomic questions. Nomenclature follows Haines and Vining's *Flora of Maine* (V.F. Thomas Press, 1998); where older works refer to a plant by another name, it is given under "Synonyms". The Natural Areas Program, within the Department of Conservation, maintains the most comprehensive source of information on Maine's rare or endangered plants and rare or exemplary natural communities, and is a member of the Association for Biodiversity Information.

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DEPARTMENT OF CONSERVATION
MAINE

Maine Department of Conservation
Natural Areas Program

Ranunculus gmelinii DC.

Small Yellow Water Crowfoot

Habitat: Springy rills, clear cold ponds, shores and meadows. [Open water (non-forested, wetland)]

Range: Eastern Quebec and Nova Scotia to Alaska, south to Maine, Michigan and Minnesota. Also in Asia.

Phenology: Flowers in July and August.

Family: Ranunculaceae

Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Aids to Identification: This species differs from the common buttercup in being semi-aquatic, the elongate stems creeping or floating in shallow water or sprawling on muddy shores or in meadows. The underwater leaves have long stalks, are flaccid in texture and are semi-transparent. The above-water leaves are thicker with 3 to 5 lobes. The golden-yellow, 5-petaled flowers occur in clusters of one to four, and mature into a cluster of achenes (dry fruits containing seeds) in a rounded head. These achenes have a persistent style that protrudes like a beak. It somewhat resembles *R. flabellaris*, the yellow water crawfoot, a species that is more common in Maine. *R. gmelinii* is recognized by its smaller size (petals 3-7 mm long, achenes 1-1.6 mm long with a beak 0.4-0.8 mm long) and achenes that are not thickened and spongy in the basal half.

Ecological characteristics: Ecological relationships in Maine are not well known.

Synonyms: Formerly known as *Ranunculus gmelinii* DC. var. *hookeri* (D. Don) L. Benson and also var. *purshii* (Richards.) Hara.

Rarity of *Ranunculus gmelinii*

State Rank:	S2	Imperiled in Maine because of rarity or vulnerability to further decline.
New England Rank:	Division 2	Regionally rare plant. Fewer than 20 current (seen since 1970) occurrences in New England.
Global Rank:	G5T5	Species demonstrably widespread, abundant, and secure globally.

Status of *Ranunculus gmelinii*

Federal Status:	None	No Federal Status.
State Status:	Threatened	Rare and, with further decline, could become endangered; or federally listed as Threatened.

Maine Department of Conservation
Natural Areas Program

Valeriana uliginosa (Torr. & Gray) Rydb.

Marsh Valerian

Habitat: Circumneutral fens, in open areas. [Forested wetland; Open wetland, not coastal nor rivershore (non-forested, wetland)]

Range: Quebec to Ontario, Maine, Vermont, New York, Ohio, Indiana, Michigan, and Wisconsin.

Phenology: Perennial, flowers May - June.

Family: Caprifoliaceae

Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Aids to Identification: Valarians are perennial herbs with opposite, pinnately compound leaves. The flowers are small and white. During flowering, the sepals appear as 5-20 narrow bristles; in fruit these elongate and form a plume that aids in wind dispersal of the fruits, similar to dandelion. *V. uglinosa* is a native species of circumneutral fens with simple basal leaves and glabrous leaflets. The introduced *V. officinalis* occurs in fields and disturbed areas. This similar looking species has pinnately-divided leaves and pubescent leaflets (on the undersurface).

Ecological characteristics: Found in cool, limy swamps associated with larch (*Larix laricina*) and white cedar (*Thuja occidentalis*). May decline as trees encroach on the openings in which it grows.

Synonyms: Former names include *Valeriana sitchensis* Bong. ssp. *uliginosa* (Torr. & Gray) Boivin.

Rarity of *Valeriana uliginosa*

State Rank:	S2	Imperiled in Maine because of rarity or vulnerability to further decline.
New England Rank:	Division 2	Regionally rare plant: Fewer than 20 current (seen since 1970) occurrences within New England.
Global Rank:	G4Q	Widespread, abundant, and apparently secure globally, but with cause for long-term concern (questionable taxonomy).

Status of *Valeriana uliginosa*

Federal Status:	None	No Federal Status.
State Status:	Special Concern	Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

▲ Historical (before 1982)
● Recent (1982- present)

Known Distribution in Maine:

This rare plant has been documented from a total of 22 town(s) in the following county(ies): Aroostook.

Dates of documented observations are: 1896 (2), 1898, 1900, 1909, 1916, 1956, 1983, 1985 (2), 1986, 1987 (2), 1989, 1992, 1998 (2), 1999, 2001 (2), 2002 (4)

Reason(s) for rarity:

Habitat naturally scarce.

Conservation considerations:

Most often found in openings within its cedar bog habitat, suggesting that decreased light with canopy closure may be limiting. Partial removal of the canopy could be beneficial to the species; complete canopy removal could cause more drastic habitat changes and would be more likely to be detrimental.

The information in this fact sheet was downloaded from the Natural Areas Program's Biological and Conservation Database on 17 MAY 2004. We are grateful to our Botanical Advisory Group for additional information on particular species, and in particular, to Arthur Haines for his assistance with identifying characteristics and taxonomic questions. Nomenclature follows Haines and Vining's *Flora of Maine* (V.F. Thomas Press, 1998); where older works refer to a plant by another name, it is given under "Synonyms". The Natural Areas Program, within the Department of Conservation, maintains the most comprehensive source of information on Maine's rare or endangered plants and rare or exemplary natural communities, and is a member of the Association for Biodiversity Information.

If you know of locations for this plant or would like more information on this species,
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State House Station 93, Augusta, Maine 04333; telephone (207) 287-8044.

Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the Proposed Potential Transmission Line Corridors, , Project #195600518, Chester to Oakfield, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
Maple - basswood - ash forest	GNR	S3		38	2004-06-24	Hardwood to mixed forest (forest, upland)
Beech - birch - maple forest	G3G5	S4		49	2004-06-09	Hardwood to mixed forest (forest, upland)
Carex oronensis	G3	S3	T	59	1996-07-10	Old field/roadside (non-forested, wetland or upland)
Valeriana uliginosa	G4Q	S2	SC	28	1988-06-28	Open wetland, not coastal nor rivershore (non-forested, wetland)
Cypripedium reginae	G4	S3	T	70	1988-06-28	Forested wetland
Carex gynocrates	G5	S2	SC	16	1988-06-28	Forested wetland
Northern white cedar woodland fen	GNR	S4		12	2006-09-12	Forested wetland
Sheep laurel dwarf shrub bog	G5	S4		43	2006-07-13	Open wetland, not coastal nor rivershore (non-forested, wetland)
Silver maple floodplain forest	GNR	S3		30	2006-07-18	Forested wetland
Hemlock forest	G4G5	S4		26	2006-06-21	Conifer forest (forest, upland)
Cypripedium reginae	G4	S3	T	71	2006-08-23	Open wetland, not coastal nor rivershore (non-forested, wetland)
Cypripedium reginae	G4	S3	T	72	2006-08-24	Forested wetland
Leatherleaf boggy fen	G5	S4		18	2006-09-07	Open wetland, not coastal nor rivershore (non-forested, wetland)
Unpatterned fen ecosystem	GNR	S4		59	2007-08-15	Forested wetland
Northern white cedar swamp	GNR	S4		20	2007-09-19	Forested wetland
Hypericum ascyron	G4	S1	E	2	2007-07-26	Forested wetland
Northern white cedar woodland fen	GNR	S4		15	2007-06-14	Forested wetland

Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the Proposed Potential Transmission Line Corridors, , Project #195600518, Chester to Oakfield, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
Unpatterned fen ecosystem	GNR	S4		64	2007-07-25	Open wetland, not coastal nor rivershore (non-forested, wetland)
Unpatterned fen ecosystem	GNR	S4		65	2007-09-26	Forested wetland
Northern white cedar swamp	GNR	S4		22	2007-09-26	Forested wetland
Leatherleaf boggy fen	G5	S4		20	2007-09-26	Open wetland, not coastal nor rivershore (non-forested, wetland)
Silver maple floodplain forest	GNR	S3		32	2007-09-18	Forested wetland
Cypripedium reginae	G4	S3	T	75	2008-07-02	Open wetland, not coastal nor rivershore (non-forested, wetland)
Valeriana uliginosa	G4Q	S2	SC	29	2008-07-02	Open wetland, not coastal nor rivershore (non-forested, wetland)
Lonicera oblongifolia	G4	S3	SC	44	2008-07-02	Forested wetland
Carex gynocrates	G5	S2	SC	19	2008-07-02	Forested wetland
Dryopteris goldiana	G4	S2	SC	27	2008-09-02	Hardwood to mixed forest (forest, upland)
Carex oronensis	G3	S3	T	53	2007-06-22	Old field/roadside (non-forested, wetland or upland)

Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the Proposed Potential Transmission Line Corridors, , Project #195600518, Chester to Oakfield, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
Red oak - northern hardwoods - white pine forest	GNR	S4		12	1986-11-08	Hardwood to mixed forest (forest, upland)
Red oak - northern hardwoods - white pine forest	GNR	S4		13	2003-06-04	Hardwood to mixed forest (forest, upland)
Mixed graminoid - shrub marsh	GNR	S5		8	1985-07-17	Open wetland, not coastal nor rivershore (non-forested, wetland)
Ranunculus gmelinii var. purshii	G5T5	S2	T	2	2003-09-02	Open water (non-forested, wetland)
Carex oronensis	G3	S3	T	18	2006-06-22	Old field/roadside (non-forested, wetland or upland)
Carex oronensis	G3	S3	T	21	1987-07-13	Old field/roadside (non-forested, wetland or upland)
Carex oronensis	G3	S3	T	22	1987-07-13	Old field/roadside (non-forested, wetland or upland)
Carex oronensis	G3	S3	T	23	2006-06-22	Old field/roadside (non-forested, wetland or upland)
Carex oronensis	G3	S3	T	24	1998-07-10	Old field/roadside (non-forested, wetland or upland)
Carex oronensis	G3	S3	T	32	2006-06-20	Old field/roadside (non-forested, wetland or upland)
Carex oronensis	G3	S3	T	55	1993-07-24	Old field/roadside (non-forested, wetland or upland)
Panax quinquefolius	G3G4	S3	E	31	1999-07-15	Hardwood to mixed forest (forest, upland)
Ranunculus gmelinii var. purshii	G5T5	S2	T	9	1991	Open water (non-forested, wetland)
Juncus subtilis	G4	S1	T	2	1901-09-25	Open wetland, not coastal nor rivershore (non-forested, wetland)
Platanthera flava var. herbiola	G4T4Q	S2	SC	7	1916-07-11	Non-tidal rivershore (non-forested, seasonally wet)
Trichophorum clintonii	G4	S3	SC	6	1916-07-10	Non-tidal rivershore (non-forested, seasonally wet)

Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the Proposed Potential Transmission Line Corridors, , Project #195600518, Chester to Oakfield, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
Carex oronensis	G3	S3	T	66	1916-07-10	Old field/roadside (non-forested, wetland or upland)
Carex praticola	G5	SX	PE	1	1898-06-09	Hardwood to mixed forest (forest, upland)
Valeriana uliginosa	G4Q	S2	SC	15	1896-07	Open wetland, not coastal nor rivershore (non-forested, wetland)
Hypericum ascyron	G4	S1	E	1	1951-08-05	Forested wetland
Carex oronensis	G3	S3	T	3	1916-07-10	Old field/roadside (non-forested, wetland or upland)
Viola novae-angliae	G4Q	S2	SC	13	1916-07-10	Non-tidal rivershore (non-forested, seasonally wet)
Sedge - leatherleaf fen lawn	G4G5	S4		3	2006-06-13	Open wetland, not coastal nor rivershore (non-forested, wetland)
Eccentric bog ecosystem	GNR	S3		7	1987-08-14	Forested wetland
Eccentric bog ecosystem	GNR	S3		8	1987-08-13	Open wetland, not coastal nor rivershore (non-forested, wetland)
Eccentric bog ecosystem	GNR	S3		9	2007-06-14	Forested wetland
Eccentric bog ecosystem	GNR	S3		10	1987-08-07	Open wetland, not coastal nor rivershore (non-forested, wetland)
Eccentric bog ecosystem	GNR	S3		12	2007-08-16	Open wetland, not coastal nor rivershore (non-forested, wetland)
Eccentric bog ecosystem	GNR	S3		16	2006-07-11	Forested wetland
Carex adusta	G5	S2	E	19	1997-08-25	Rocky coastal (non-forested, upland)
Valeriana uliginosa	G4Q	S2	SC	13	1909-06-09	Open wetland, not coastal nor rivershore (non-forested, wetland)
Cardamine maxima	G5	S1	SC	2	2003-06-04	
Hemlock forest	G4G5	S4		21	2003-06-05	Conifer forest (forest, upland)

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

S3 Rare in Maine (20-100 occurrences).

S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine.

SU Under consideration for assigning rarity status; more information needed on threats or distribution.

S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.

G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

G3 Globally rare (20-100 occurrences).

G4 Apparently secure globally.

G5 Demonstrably secure globally.

GNR Not yet ranked.

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

STATE LEGAL STATUS

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

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.

T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

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

ELEMENT OCCURRENCE RANKS - EO RANKS

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

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

These three factors are combined into an overall ranking of the feature of **A, B, C, or D**, where **A** indicates an excellent example of the community or population and **D** indicates a poor example of the community or population. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program.

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

JOHN E. BALDACCI
GOVERNOR

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

ROLAND MARTIN
COMMISSIONER

March 26, 2009

Ms. Joy Prescott
Project Manager
Stantec
30 Park Drive
Topsham, Maine 04086

Dear Joy:

Thank you for sending your written response with maps and additional information in reference to our letter of March 10, 2009. At this stage in preconstruction monitoring for the Oakfield Wind Power Project no additional studies are warranted for birds or bats in nocturnal radar studies or for migration raptor counts.

Reference your second bullet in your letter of March 16th, there may have been some confusion in our request, but we were looking for a scatter plot between flight height and passage rate (X = passage rate, Y = flight height) in order to demonstrate a predictive relationship between the 2 data sets. The raw data would be fine if necessary and we could plot this out. If you still have questions related to this request please let me know.

The "rare animal forms" do not need to be completed for flybys by eagles. They should be used for a potential breeding record or any other occurrence for E/T or Special Concern (SC) species. There may be some SC bird species on the list we can discuss due to frequency of occurrence such as White-throated sparrow, and Veery but we can deal with this if conditions arise. The main bird species we would be concerned about would hedge around all E/T species, Rusty Blackbird, Olive-sided Flycatcher, and Bicknell's Thrush. We would like this form to be used for all E/T and SC bat species if possible.

Reference your comment concerning the expansion sites as outlined on map along the Oakfield Hills area. MDIFW feels no additional preconstruction requirements are needed for this present outlined expansion zone due to its juxtaposition to the present primary site. The Department wants to be perfectly clear that postconstruction mortality monitoring will be requested for present primary site and expansion zone as outlined on map. If either of these two areas continues to expand outside the present Oakfield Hills area preconstruction monitoring would once again be considered.

Thank you for your time and consideration in the above mentioned sections and please keep us posted on these potential expansion plans. If you should have any further questions or would like additional explanation please let me know.

Sincerely,

Richard Hoppe
Regional Wildlife Biologist, MDIFW
Region G
PO Box 447
Ashland, Maine 04732

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Field Office – Ecological Services
17 Godfrey Drive, Suite #2
Orono, ME 04473
(207) 866-3344 Fax: (207) 866-3351

In Reply Refer To: 53411-2009-I-0314
FWS/Region5/ES/MEFO

November 23, 2009

Jennifer McCarthy
Chief, Regulatory Division
U. S. Army Corps of Engineers
696 Virginia Road
Concord, Ma 01742-2751

Dear Ms. McCarthy:

Thank you for your letter dated October 13, 2009 requesting informal consultation for an application for Evergreen Wind Power II, LLC, Oakfield Wind Project (#NAE-2009-00386) in Aroostook County, Maine. This letter provides the Fish and Wildlife Service's (Service) response pursuant to Section 7 of the Endangered Species Act (ESA), as amended (16 U.S.C. 1531-1543), Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) and the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667d).

Evergreen Wind Power II, LLC proposes construction of the Oakfield Wind Project in Oakfield Maine. The project is expected to consist of 34 GE 1.5 MW turbines in Oakfield Hills. There will be four permanent 80-meter met towers and temporary 80-meter met towers at certain turbine locations during initial testing. There will be a total of approximately 15.3 miles of project roads of 12- or 32-foot width based on use. Power from the turbines will be collected in an overhead 34.5 kV lead collector line that will connect to an upgraded 69-kV line at the north end of the project. Total project footprint (clearing for turbines, new roads, transmission lines) is 256.5 acres of which 211 acres will be allowed to revegetate.

After construction all roads will be allowed to revegetate to a 12-foot width. Turbine pads and transmission line corridors will be maintained in a native shrub cover type and will provide early successional habitat for wildlife.

Federally listed species

Canada lynx

The federally-threatened Canada lynx could occur in Oakfield Township in the vicinity of the proposed project, however, no confirmed occurrences of lynx are known from this township. Oakfield abuts, but is outside of the designated lynx critical habitat. Maine Inland Fisheries and

TAKE PRIDE® IN AMERICA

Wildlife conducted lynx snow track surveys in Herseytown (two townships to the west) and did not find lynx, but did find lynx in T7 R5 (two townships to the northwest).

Evergreen contracted with Stantec to identify lynx habitat in the project area. Maps of potential lynx habitat (regenerating softwood, dense mixed wood and deciduous stands) were developed for the entire town of Oakfield and overlaid with the project footprint. Potential lynx habitat is limited in Oakfield and is located primarily scattered areas across the southern portion of the town. Most suitable habitat occurs along the eastern border of the town, approximately three miles from the project area. The ridgetops in the Oakfield Hills and most of the project area (245.9 of 256.5 acres) is dominated by deciduous forest cover types. Potential lynx and snowshoe habitat occurs at the southern portion of the area and is comprised of 10.6 acres of softwood/mixed forest of which 1.4 acres is believed to be in conditions that currently support high hare densities. The size and distribution of patches of potential habitat at the southern portion of the project area not sufficient to support a lynx home range and lynx, however lynx may be present as they disperse through the project area.

Adverse effects to Canada lynx could occur from loss of habitat, disturbance from road construction, direct road mortality (construction phase and post-construction operation), indirect road-related mortality (public traffic on roads, increased access for hunting and trapping). The effect of wind turbine operations (sound, visual impacts) on lynx or closely-related carnivore species is unknown.

Loss of habitat - The project impacts 256 acres of which 211 acres will be allowed to revegetate into early successional forest. Transmission line rights of way will be allowed to revegetate into early successional forest. These areas may create small patches of snowshoe hare habitat that may be of benefit to lynx, however, much of the habitat will be dominated by hardwoods. Transmission line corridors should not present a dispersal or movement barrier to lynx. A habitat map showed that lynx habitat (boreal forest with preferred snowshoe hare habitat) is rare on ridgelines where towers, roads, and transmission lines will be constructed. About 45 acres will be converted to non-forest habitat. There will be about 10.6 acres of potential lynx habitat temporarily lost during construction, and much of this area will be allowed to revegetate after construction. The permanent footprint of this project (45 acres) represents as small amount of habitat loss for lynx in a township which already has limited potential for lynx habitat.

The construction of 15.3 miles of new roads could provide forest land owners access into new areas to harvest. However, much of the project area already has logging roads and has been recently logged.

Only 0.65 miles of 15.3 miles (4%) of new roads intersects with potential softwood-dominated lynx habitat. Habitat loss to roads will only be a few acres and is insignificant.

Disturbance from road construction – Most townships on industrial forestlands in northern Maine are heavily roaded with single-lane logging roads (typically 80-120 km of road per 100 km^2 township). Lynx occur in northern Maine in heavy roaded townships. (Usually heavily roaded townships have more intense forest management, which, in many instances have benefitted lynx.) Forest road work is common in townships where lynx occur. Maine Inland

Fisheries and Wildlife has documented lynx dens have often been found less than ¼ mile from roads. It is unlikely that new road construction will disturb lynx to a point that will adversely affect or harm (kill or cause injury) as lynx are expected to be rarely encountered in Oakfield.

Direct road mortality (construction and post-construction) - Lynx road mortality is not likely during or after construction. There will be hundreds of trips by large trucks and smaller vehicles to the site to construct the wind facility over a two year period. Traffic speeds (especially for large trucks) will be <20-30 mph on logging roads. About 15 lynx have been killed on logging roads in Maine from 2000-2009. Post construction traffic will be several vehicles/day. We believe risk of incidental take insignificant because lynx are expected to rarely occur in the project area.

Indirect road-related mortality – There will be about 15.3 miles of new road construction in Oakfield. This project will increase roads in the township by a small amount. In Maine from 2000-2009, four lynx were shot illegally and 47 lynx were reported incidentally trapped during the trapping season (about 5 to 8 reported each year). Because of the number of landowners and existing access in the project area, it is the intent of the landowner to keep all roads open to the public. Creating new roads will increase access to new areas by hunters and trappers. However, the increased probability of take by hunting for this project is insignificant and discountable. Lynx may occasionally disperse through the township and the increased likelihood of trapping a lynx in Oakfield as a result of increased access from 15.3 miles of new roads is very low.

Minimization measures

The Army Corps of Engineers proposes the following measures to minimize potential impacts to the Canada lynx and its habitat as special permit conditions:

1. Upon completion of construction, the turbine pad sites (with the exception of the area within 25' radius of the turbine, and adjacent crane pad, which will remain a gravel surface), temporary shoulders of the access roads created for the crane access and lay down areas shall be stabilized, loamed, and seeded with native species to promote natural revegetation. Thos areas shall be allowed/encouraged to develop a dense growth of low ground cover and shrub species.
2. The effects of installing and operating wind turbines on Canada lynx and other carnivores is unknown. Anecdotal lynx track sightings should be documented by project personnel for a three year period after construction. The location of tracks should be mapped, photographed, and provided in a report annually to USFWS at the U. S. Fish and Wildlife Service, Maine Field Office, 17 Godfrey Drive, Suite #2, Orono, ME 04473.
3. Routine vegetation maintenance of the collector line corridor shall occur in accordance with and as outlined in the Post-Construction Vegetation Management Plan for the Oakfield Wind Project.
4. Traffic speeds during and after construction shall be kept less than 30mph (road design speed) to minimize collisions with lynx and other wildlife.

Additional recommendations

The Service has no additional recommendations to minimize effects to Canada lynx.

Atlantic salmon

The Oakfield Wind Project occurs within the range of the Gulf of Maine Distinct Population Segment of Atlantic salmon and within a watershed that is designated as critical habitat. During a June 11, 2009 site visit by Norm Dube, an Atlantic salmon biologist with the Maine Department of Marine Resources, it was determined that the unnamed tributary of Downing Brook (where a new stream crossing is proposed) provides suitable habitat for juvenile Atlantic salmon but not adults. A section of ledge outcroppings downstream of the proposed road crossing present a cascade that is impassable to juvenile Atlantic salmon. Because of the presence of a natural barrier to fish passage downstream of the proposed road crossing, this stream location does not contain critical habitat. Because Atlantic salmon are routinely stocked into the East Branch Mattawamkeag River (into which Downing Brook flows), it is possible that Atlantic salmon occur in the general project area. Downing Brook and its tributaries, however, have never been surveyed for the presence of salmon.

Since there is no critical habitat present at the proposed road crossing and a natural barrier prevents juvenile Atlantic salmon from reaching the project site, the Service would not expect any effects from the construction of the road crossing. Further, the Corps will require standard sediment and erosion control measures during all construction activities that could affect the stream. On October 9, 2009 LeeAnn Neal of your staff discussed potential effects of this project on Atlantic salmon and critical habitat with Wende Mahaney of my staff; we concurred with your determination that this project (in particular the proposed construction of a stream crossing) would have no effect on Atlantic salmon or critical habitat.

Summary

Based on the information and recommendations above, the Service concurs with your determination that the Oakfield Wind Project may affect, but is unlikely to adversely affect the Canada lynx. The project would have no effect on Atlantic salmon or designated critical habitat. Accordingly, no further action is required under Section 7 of the ESA, unless: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by the identified action.

We plan to comment on the bald eagle and migratory bird surveys in a separate letter.

If you have any questions, please call Mark McCollough, endangered species biologist, at (207) 866-3344, Ext. 115.

Sincerely,

Erin Williams

Erin Williams for
Lori Nordstrom, Project Leader
Maine Field Office

cc: Steve Timpano, MDIFW

Jay Clement, USACOE

JOHN E. BALDACCI
GOVERNOR

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

ROLAND MARTIN
COMMISSIONER

March 16, 2010

Brooke:

I have enclosed two printouts showing the project areas around the Towns of Oakfield and Dyer Brook, Aroostook County, Maine. As in the past I would suggest you contact DOC, Natural Areas to inquire about flora in the area. . I would also suggest you contact Tom Hodgman, Avian biologist and Jonathan Mays, the Herpetologist both out of our Bangor Office concerning special habitats which may not have come up on my search.

Of significance would be the active eagle nest site off the West end of Drews Lake dead water, in the Town of Oakfield If there are any other issues or concerns which I can help you with please don't hesitate to call or email.

Regards,

Richard Hoppe

Richard Hoppe
Regional Wildlife Biologist, Region G, Ashland
PO Box 447
Ashland, ME 04732

AqETSc

These are observations of endangered, threatened, or special concern species associated with aquatic habitats that MAY be affected by a project in the search area.

This list is a 'heads-up' for further consideration. You may wish to contact MDIFW staff about these observations:
Herps: Phillip deMaynadier or Jonathan Mays
Mussels: Beth Swartz
Other Inverts: Phillip deMaynadier or Beth Swartz
Fish: Merry Gallagher
Birds: Tom Hodgman, Lindsay Tudor, or Danielle D'Auria

==========

AQUATIC ETSc OBSERVATIONS WITHIN 2.5 MILES OF SEARCH AREA:

None

RARE MUSSELS WITHIN 5 MILES OF SEARCH AREA:

IMBIV02100/178 - Brook Floater
IMBIV21050/1007 - Yellow Lampmussel
IMBIV42030/1371 - Creeper

==========

OPTIONS TO FORWARD/SAVE THIS INFORMATION:

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3) Save this Notepad file for future reference
   - Click FILE, then SAVE AS....
   - Save as a NEW file under your personal folder.

HMaprpt

MAINE DEPARTMENT OF INLAND FISHERIES & WILDLIFE
P.O. Box 447, Ashland, ME 04732-0447
Phone: (207) 435-3231, FAX: (207) 435-2009

SITE-SPECIFIC SEARCH of WILDLIFE OBSERVATIONS and HABITAT

Search Parameters

County:	Aroostook
IF&W Region:	G
Township(s):	T4 R3 WELS, Oakfield, Linneus, New Limerick
Search Center:	572694 east, 5102652 north (UTM NAD83 coordinates)
Search Area:	31.20 sq. miles
Date:	Monday, March 15, 2010

Results

ESSENTIAL WILDLIFE HABITATS

Essential Habitats are areas currently or historically providing physical/biological features essential to conserving an endangered/threatened species in Maine and that may require special management consideration. These areas are identified and mapped by MDIFW and adopted through public rulemaking procedures following Maine's Administrative Procedures Act. Since 1989, designation criteria and protection guidelines have been developed for bald eagles, roseate terns, least terns, and piping plovers. Addition of new areas and deletion of areas no longer eligible is a continuing process.

The Maine Endangered Species Act prohibits state agencies or municipal governments from permitting, licensing, funding, or carrying out projects that would significantly alter a designated Essential Habitat or that would violate its protection guidelines. If a project site is partly or wholly within an Essential Habitat, it must be evaluated by MDIFW before state/municipal permits can be approved or project activities can occur. Designation of Essential Habitat establishes a standardized review process within existing state and municipal permitting processes. Activities of private landowners are not affected by Essential Habitat designation unless they require a state or municipal permit or are funded or carried out by a state agency or municipality.

This regulatory tool is used only when habitat loss is a major limit to species recovery. Criteria for designating Essential Habitats, protection guidelines listing types of projects that must be reviewed, factors considered during project evaluations, and maps showing designated Essential Habitats are adopted in Inland Fisheries and Wildlife Rules. Essential Habitat maps and information are available from the permitting officials, MDIFW offices, and the Maine Office of GIS at http://megis.maine.gov.

Bald Eagle Nest Sites

Bald eagle Essential Habitat focuses on the nest site to maintain breeding habitat and prevent disturbances that may cause nest failure. A "nesting area" is a locality that contains at least one nest site and has been used by a pair of nesting bald eagles. "Occupied" means that at least one adult eagle, eagle eggs, or eagle chicks are present at any time between March 1 and July 15.

To be identified and mapped as Essential Habitat, a bald eagle nest site must be within a nesting area occupied in at least 1 of the last 3 years and have either a nest that has existed for 2 consecutive years or have the only nest in that nesting area. All nest sites in a nesting area designated as Essential Habitat will be deleted if the nesting area has not been occupied at any time during the last 5 years. An individual nest site within an active nesting area will be deleted if a nest structure has not existed at any time during the last 5 years or the

Commissioner of MDIFW determines that the site is no longer suitable nesting habitat.

Nest Site Number
344A

Piping Plover / Least Tern Nesting, Feeding, and Brood-rearing Areas
None Found

Roseate Tern Nesting Areas
None Found

NATURAL RESOURCE PROTECTION ACT (NRPA) HABITATS

Title 38, Chapter 3, Article 5-A, Section 480 of M.R.S.A. identifies habitats protected under the Natural Resources Protection Act (NRPA). Included in the definitions section (480-B) is "Significant Wildlife Habitat," which means areas that have been mapped by MDIFW or are within any other protected natural resource including habitat for listed endangered/threatened animal species; high/moderate value deer wintering areas; high/moderate value waterfowl/wading bird habitat; shorebird nesting, feeding, and staging areas; seabird nesting islands; and significant vernal pools (http://www.maine.gov/ifw/wildlife/habitat_data/significant_habitat_data.htm). Data requested for NRPA purposes should be obtained from Maine DEP.

Seabird Nesting Islands
None Found

Deer Winter Areas

A forested area used by deer when snow depth in the open/hardwoods is > 12", deer sinking depth in the open/hardwoods is > 8", and mean daily temperatures are below 32 degrees F. Non-forested wetlands, non-stocked clearcuts, hardwood types, and stands predominated by Eastern Larch are included within the DWA only if less than 10 acres in size. Agricultural and development areas within DWAs are excluded regardless of size.

Ratings for Deer Winter Areas were based on aerial and/or ground surveys. If only an aerial survey was done (most DWAs), the rating was "indeterminate." If a follow-up ground survey was done also, the evaluation was based on 1) quality of softwood shelter, 2) intensity of deer use, and 3) size. The final rating of the DWA was determined by summing the scores for the three criteria and assigning a rating as follows: high (score of 10-12), moderate (score of 7-9.9), or low (score of 0-6.9). A regional biologist may recommend a rating change with justification and approval by the management section supervisor. No delisting criteria for regulated NRPA DWAs have been developed.

Code	Size (acres)	Rating
123002	49.3182343196	indeterminate

CODE = unique identifier of Deer Wintering Area

RATING = DWAs must have a moderate or high rating to qualify under NRPA

Inland Waterfowl/Wading Bird Habitats

Areas rated as high or moderate qualify as NRPA habitats. The mapped boundary includes a 250-ft upland zone that is used by wildlife associated with the

wetland. This data set was developed in accordance with NRPA and the Comprehensive Planning and Land Use Regulation Act (Growth Management).

Code	Rating	Wetland Acres
Iwwh131086	M	23.6
Iwwh131085	H	111.4
Iwwh204999	M	12.6
Iwwh131652	M	80.6358374768
Iwwh131076	H	508.9

CODE = Unique identifier assigned by MDIFW to the polygon.

RATING = Inland waterfowl/wading bird habitats with a "high" or "moderate" rating are considered as NRPA.

WETLAND ACRES = size of wetland in acres (this does not include 250-ft upland zone).

Tidal Waterfowl/Wading Bird Habitats
None Found

Shorebird Areas
None Found

Significant Vernal Pools
None Found

LAND USE REGULATION COMMISSION (LURC) DEER WINTER AREAS AND SEABIRD NESTING ISLANDS
None Found

ENDANGERED, THREATENED, OR SPECIAL CONCERN SPECIES OBSERVATIONS

ETSc is designed to manage mapped habitats based on observations of wildlife species that are Endangered, Threatened, or of Special Concern. Until a habitat polygon has been mapped for an observation, the environmental review polygon is represented by a 0.25-mile circle around the observation point.

Environmental Review Polygons

Classification of ETSc observations as Use = "Environmental Review" indicates that the habitat around the observation should receive special management consideration based on the species involved (endangered, threatened, or special concern), importance or rarity of the habitat, or whether the observation is recent or historical. Any questions regarding ETSc observations should be directed to MDIFW's species specialists in WRAS.

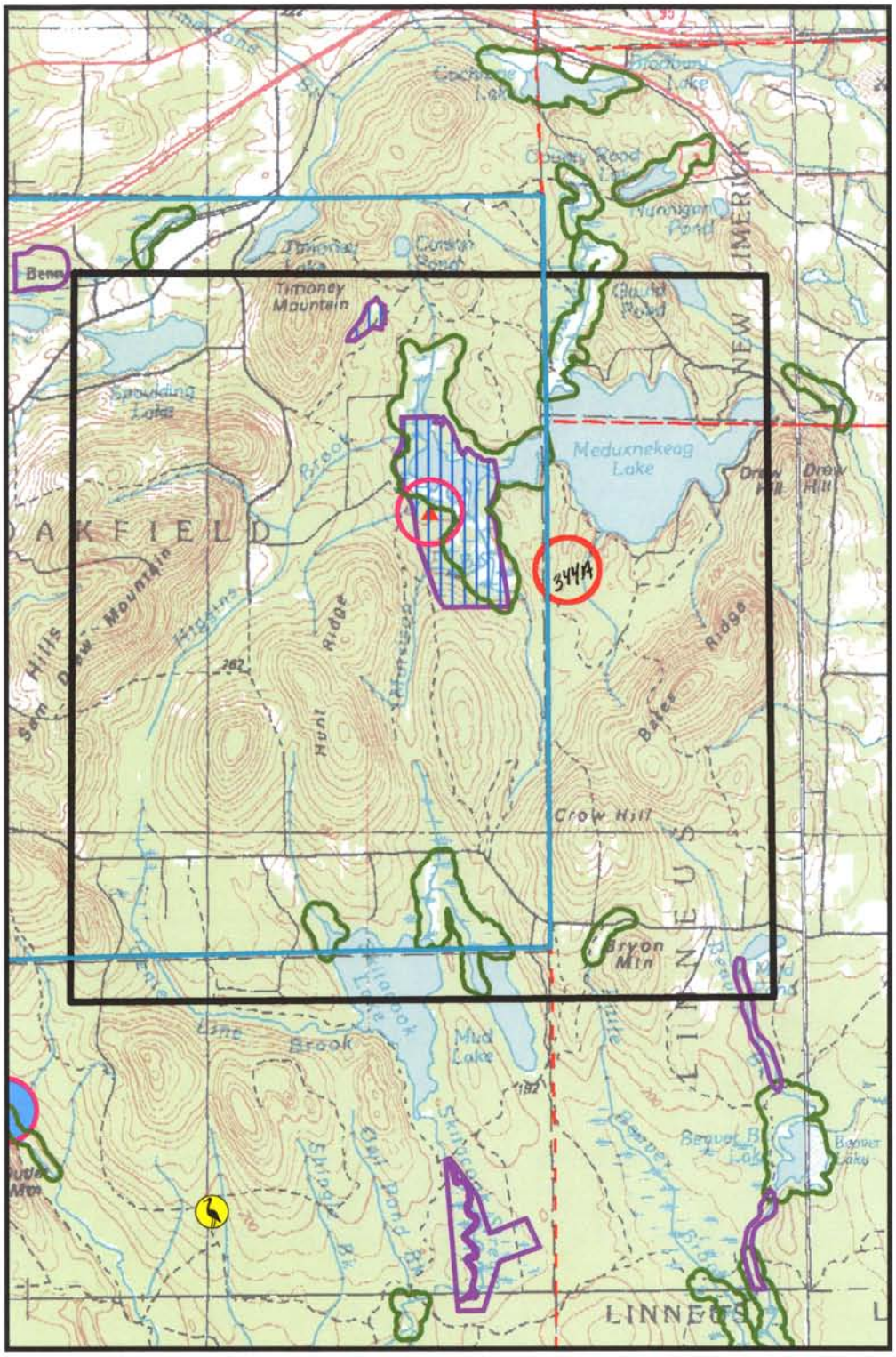
Code	ObsID	Use	Common Name
Poly_5059			
	4797	ER	Bald Eagle

CODE = unique identifier of habitat

OBSID = unique identifier of species observation linked to ER polygon

USE = observations are rated as environmental review (ER) or internal only (IO)

Search for Wildlife Observations & Habitat-Oakfield



- Bald Eagle Nest Site
- Piping Plover / Least Tern Nesting, Feeding, & Brood-rearing Area
- Roseate Tern Nesting Area
- Deer Winter Area
- Inland Waterfowl / Wading Bird Habitat
- Tidal Waterfowl / Wading Bird Habitat
- Seabird Nesting Island
- Shorebird Area
- Significant Vernal Pool
- Endangered, Threatened, & Special Concern Species Habitat
- Township Boundary
- County

wind energy project-Stantec

0 0.7 1.4 2.1 2.8 Miles

1 = 83,692

UTM Projection, Zone 19N, NAD83

N

P.O. Box 447
Ashland, ME 04732-0447
Voice: (207) 435-3231
Fax: (207) 435-2009
March 15, 2010

AqETSc

These are observations of endangered, threatened, or special concern species associated with aquatic habitats that MAY be affected by a project in the search area.

This list is a 'heads-up' for further consideration. You may wish to contact MDIFW staff about these observations:
Herps: Phillip deMaynadier or Jonathan Mays
Mussels: Beth Swartz
Other Inverts: Phillip deMaynadier or Beth Swartz
Fish: Merry Gallagher
Birds: Tom Hodgman, Lindsay Tudor, or Danielle D'Auria

==========

AQUATIC ETSc OBSERVATIONS WITHIN 2.5 MILES OF SEARCH AREA:

None

RARE MUSSELS WITHIN 5 MILES OF SEARCH AREA:

IMBIV02100/115 - Brook Floater
IMBIV02100/176 - Brook Floater
IMBIV02100/177 - Brook Floater
IMBIV02100/178 - Brook Floater
IMBIV21050/977 - Yellow Lampmussel
IMBIV21050/1007 - Yellow Lampmussel
IMBIV21050/1012 - Yellow Lampmussel
IMBIV42030/1369 - Creeper
IMBIV42030/1371 - Creeper
IMBIV42030/2539 - Creeper

==========

OPTIONS TO FORWARD/SAVE THIS INFORMATION:

1) Cut-and-paste this text into an email message by doing the following:
   - highlight block of text in this message
   - right-click and select COPY
   - Switch from Citrix to your own desktop
   - Open a new email in Outlook
   - Go to the email message area, right-click, and select PASTE

2) Print this file from Notepad, OR

3) Save this Notepad file for future reference
   - Click FILE, then SAVE AS....
   - Save as a NEW file under your personal folder.

HMaprpt

MAINE DEPARTMENT OF INLAND FISHERIES & WILDLIFE
P.O. Box 447, Ashland, ME 04732-0447
Phone: (207) 435-3231, FAX: (207) 435-2009

SITE-SPECIFIC SEARCH of WILDLIFE OBSERVATIONS and HABITAT

Search Parameters

County:	Aroostook
IF&W Region:	G
Township(s):	T4 R3 WELS, Hersey, Island Falls, Dyer Brook, Crystal, Oakfield
Search Center:	559514 east, 5099256 north (UTM NAD83 coordinates)
Search Area:	37.99 sq. miles
Date:	Monday, March 15, 2010

Results

ESSENTIAL WILDLIFE HABITATS

Bald Eagle Nest Sites
None Found

Piping Plover / Least Tern Nesting, Feeding, and Brood-rearing Areas
None Found

Roseate Tern Nesting Areas
None Found

NATURAL RESOURCE PROTECTION ACT (NRPA) HABITATS

Title 38, Chapter 3, Article 5-A, Section 480 of M.R.S.A. identifies habitats protected under the Natural Resources Protection Act (NRPA). Included in the definitions section (480-B) is "Significant Wildlife Habitat," which means areas that have been mapped by MDIFW or are within any other protected natural resource including habitat for listed endangered/threatened animal species; high/moderate value deer wintering areas; high/moderate value waterfowl/wading bird habitat; shorebird nesting, feeding, and staging areas; seabird nesting islands; and significant vernal pools (http://www.maine.gov/ifw/wildlife/habitat_data/significant_habitat_data.htm). Data requested for NRPA purposes should be obtained from Maine DEP.

Seabird Nesting Islands
None Found

Deer Winter Areas

A forested area used by deer when snow depth in the open/hardwoods is > 12", deer sinking depth in the open/hardwoods is > 8", and mean daily temperatures are below 32 degrees F. Non-forested wetlands, non-stocked clearcuts, hardwood types, and stands predominated by Eastern Larch are included within the DWA only if less than 10 acres in size. Agricultural and development areas within DWAs are excluded regardless of size.

Ratings for Deer Winter Areas were based on aerial and/or ground surveys. If only an aerial survey was done (most DWAs), the rating was "indeterminate." If a follow-up ground survey was done also, the evaluation was based on 1) quality of softwood shelter, 2) intensity of deer use, and 3) size. The final rating of the DWA was determined by summing the scores for the three criteria and assigning a

rating as follows: high (score of 10-12), moderate (score of 7-9.9), or low (score of 0-6.9). A regional biologist may recommend a rating change with justification and approval by the management section supervisor. No delisting criteria for regulated NRPA DWAs have been developed.

Code	Size (acres)	Rating
100169	978.721761345	indeterminate
123301	666.498269154	indeterminate
100170	2955.54191317	indeterminate
123300	3598.3676899	indeterminate
100169	289.49654995	indeterminate

CODE = unique identifier of Deer Wintering Area

RATING = DWAs must have a moderate or high rating to qualify under NRPA

Inland Waterfowl/Wading Bird Habitats

Areas rated as high or moderate qualify as NRPA habitats. The mapped boundary includes a 250-ft upland zone that is used by wildlife associated with the wetland. This data set was developed in accordance with NRPA and the Comprehensive Planning and Land Use Regulation Act (Growth Management).

Code	Rating	Wetland Acres
Iwwh202669	H	369.1
Iwwh202670	M	5.4
Iwwh204384	M	23.8
Iwwh204385	M	12.2
Iwwh111450	H	157.9
Iwwh111461	H	24.0650707761
Iwwh205357	M	37.8627280338
Iwwh111441	H	285.121101652
Iwwh111442	H	11.7829745518
Iwwh111443	M	14.3481829948
Iwwh111456	M	13.7236400954

CODE = Unique identifier assigned by MDIFW to the polygon.

RATING = Inland waterfowl/wading bird habitats with a "high" or "moderate" rating are considered as NRPA.

WETLAND ACRES = size of wetland in acres (this does not include 250-ft upland zone).

Tidal Waterfowl/Wading Bird Habitats
None Found

Shorebird Areas
None Found

Significant Vernal Pools
None Found

LAND USE REGULATION COMMISSION (LURC) DEER WINTER AREAS AND SEABIRD NESTING ISLANDS
None Found

ENDANGERED, THREATENED, OR SPECIAL CONCERN SPECIES OBSERVATIONS

ETSc is designed to manage mapped habitats based on observations of wildlife species that are Endangered, Threatened, or of Special Concern. Until a habitat polygon has been mapped for an observation, the environmental review polygon is represented by a 0.25-mile circle around the observation point.

Environmental Review Polygons

Classification of ETSc observations as Use = "Environmental Review" indicates that the habitat around the observation should receive special management consideration based on the species involved (endangered, threatened, or special concern), importance or rarity of the habitat, or whether the observation is recent or historical. Any questions regarding ETSc observations should be directed to MDIFW's species specialists in WRAS.

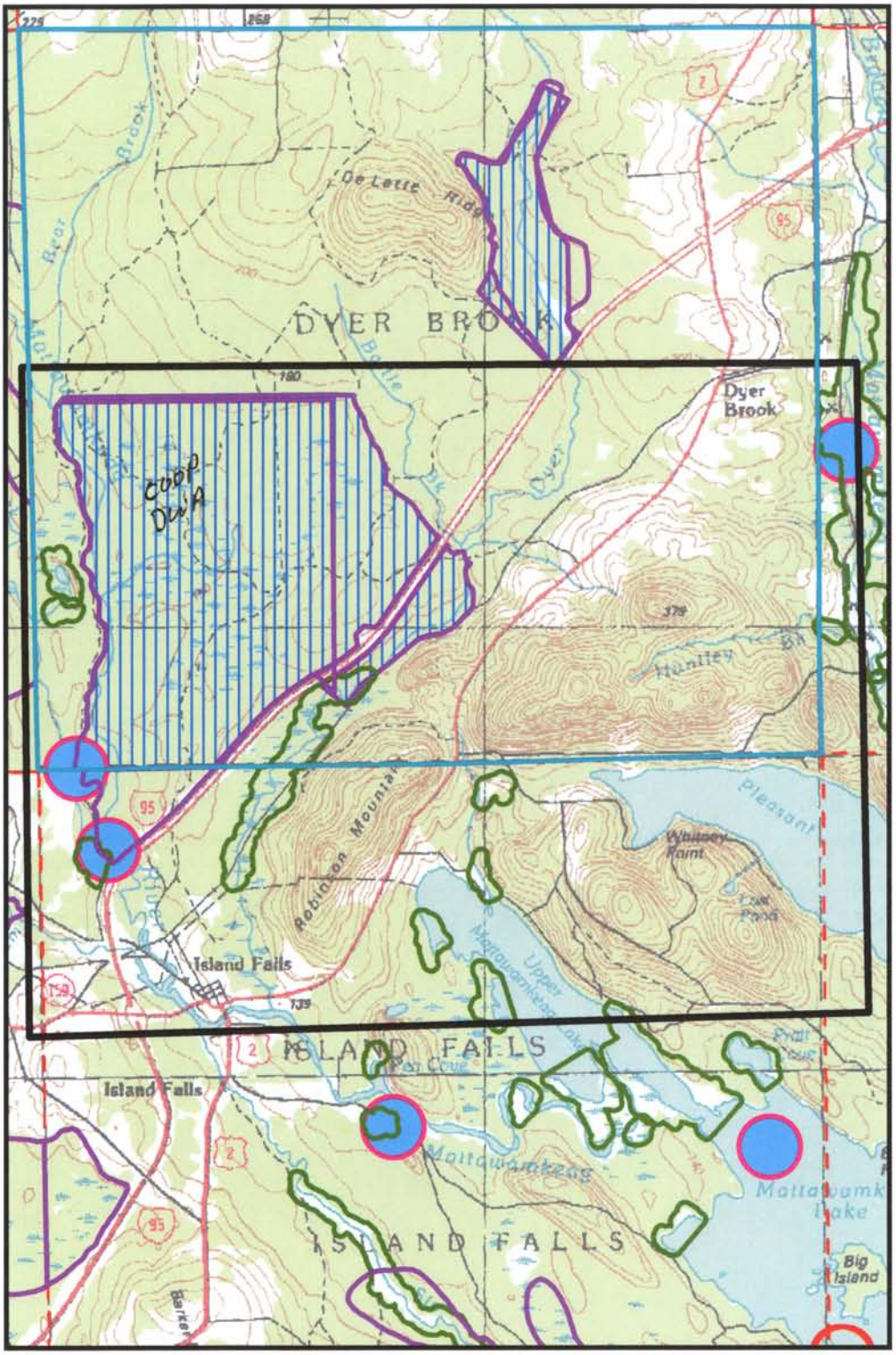
Code	ObsID	Use	Common Name
Poly_117	115	ER	Brook Floater
Poly_1373	1371	ER	Creeper
Poly_2541	2539	ER	Creeper

CODE = unique identifier of habitat

OBSID = unique identifier of species observation linked to ER polygon

USE = observations are rated as environmental review (ER) or internal only (IO)

Search for Wildlife Observations & Habitat-Dyer Bk.



- Bald Eagle Nest Site
- Piping Plover / Least Tern Nesting, Feeding, & Brood-rearing Area
- Roseate Tern Nesting Area
- Deer Winter Area
- Inland Waterfowl / Wading Bird Habitat
- Tidal Waterfowl / Wading Bird Habitat
- Seabird Nesting Island
- Shorebird Area
- Significant Vernal Pool
- Endangered, Threatened, & Special Concern Species Habitat
- Township Boundary
- County

Wind Energy-Stantec

0 0.75 1.5 2.25 3 Miles

1 = 88,400

UTM Projection, Zone 19N, NAD83

N

P.O. Box 447
Ashland, ME 04732-0447
Voice: (207) 435-3231
Fax: (207) 435-2009
March 15, 2010

Figure 2
Transmission Project Area Map

GOVERNOR
John E. Baldacci

COMMISSIONER
Roland D. Martin

Wildlife Division
73 Cobb Road
Enfield, ME 04493

March 15, 2010

Stantec Consulting
Attn: Dale Knapp
30 Park Drive
Topsham, ME 04086

Dear Dale:

I have received your letter requesting Essential and Significant Habitat information for your project located in Island Falls and T4 R3 WELS.

Essential Habitats:

Essential Habitats are defined as "areas currently or historically providing physical or biological features essential to the conservation of an endangered or threatened species in Maine and which may require special management considerations". Essential Habitat protection in Maine currently applies to roseate and least terns, and piping plover nest sites. Additional listed species may receive attention in the future.

According to MDIFW records, there are no Essential Habitats known to be associated with your project areas located in Island Falls and T4 R3 WELS.

Significant Wildlife Habitats:

The Natural Resources Protection Act (NRPA), administered by the Maine Department of Environmental Protection (DEP), provides protection to certain natural resources including Significant Wildlife Habitats. Significant Wildlife Habitats are defined by the NRPA as:

> Habitat for state and federally listed endangered and threatened species.
>
> High and moderate value deer wintering areas (DWAs) and travel corridors.
>
> High and moderate value waterfowl and wading bird habitats (WWHs), including nesting and feeding areas.

Shorebird nesting, feeding, and staging areas.

Seabird nesting islands.

According to MDIFW records, there is a Waterfowl/Wadingbird Habitat associated with each of your project areas. Please refer to the enclosed maps.

Finally, MDIFW maintains a statewide database of endangered, threatened and special concern wildlife species and their habitats. These include endangered and threatened species not included under Essential Habitat and species that are of special concern to MDIFW but for which sufficient data may be currently lacking. The State Threatened brook floater has been surveyed in the East Branch of the Mattawamkeag River.

Sincerely,

Mark A. Caron

Mark A. Caron
Regional Wildlife Biologist
Phone: 207-732-4132
Fax: 207-732-4405
E-Mail: mark.caron@maine.gov

Appendix 7-4
2010 Bald Eagle Aerial Flight Survey Memo

Memo

To:	Geoff West	From:	Bryan Emerson
	First Wind		Stantec Consulting
File:	195600518	Date:	June 23, 2010

Reference: Spring 2010 Aerial Survey
Maine GenLead 115-Kilovolt Transmission Line Project

As requested, Stantec Consulting (Stantec) conducted aerial surveys for bald eagle (*Haliaeetus leucocephalus*) nests, osprey (*Pandion haliaetus*) nests, and great blue heron (*Ardea herodias*) rookeries[1] in the vicinity of the proposed Maine GenLead 115-kilovolt Transmission Line Project (project). The survey area included an approximately 0.25-mile wide corridor along the proposed transmission line route between Chester and Oakfield, Maine. Prior to the survey, Stantec reviewed information provided by the Maine Department of Inland Fisheries and Wildlife (MDIFW) regarding known active and historic bald eagle nest locations and documented great blue heron nesting activity in the vicinity of the project area. Stantec also consulted with Charlie Todd of the MDIFW, who confirmed that the aerial survey was performed at an appropriate time of year and employed methods consistent with the MDIFW and U.S. Fish and Wildlife Service (USFWS) aerial survey protocol. In compliance with USFWS National Bald Eagle Management Guidelines (May 2007), Stantec also notified Mark McCullough of the USFWS Maine Field Office that flights were planned in this area and that Stantec was coordinating with MDIFW on the timing and methods of the flights.

Survey Methods

Stantec conducted two aerial surveys. The first flight was conducted on May 5, 2010. The purpose of the first flight was to identify new nests and to assess eagle nesting activity at known nest locations within the project area. The timing of the first flight was chosen in consultation with MDIFW to correspond with the time period when bald eagles are actively incubating eggs. The second flight was conducted on June 9, 2010, to check the status of active nests in the project area and to perform a second search on areas where a nest was suspected but not seen during the first flight. The timing of the second flight was chosen to correspond to the time period when eaglets have hatched and are visible in the nest to determine hatching success.

The surveys consisted of two low altitude passes, approximately 500 feet above ground level, along the proposed corridor in both directions. Stantec surveyed the shoreline of the Penobscot River for a distance of approximately one mile upstream and downstream of the proposed crossing. Other waterbodies and bogs, wetlands, and flowages within the corridor and immediately adjacent to the corridor were also surveyed. These waterbodies included Mattaseunk Lake, Molunkus Lake, Reed Pond, and the East and West Branch of the Mattawamkeag River. The shorelines of the waterbodies were surveyed for bald eagle or osprey nest sites, as well as for great blue heron rookeries. Incidental observations of adult and sub-adult bald eagles were also recorded.

Survey Results

Stantec identified several active bald eagle nests in the vicinity of the project area, but none within the Project corridor itself. Stantec identified two active bald eagle nests along the Penobscot River, one upstream of the proposed crossing and one downstream. The

[1] A "rookery" is a nesting colony of great blue heron nests generally located in woodlands or in swamps, bogs, and other large, open wetland areas. In Maine, rookeries range in size from 1 to 120 nests, with the average between 8 and 12 nests according to MDIFW. Individual nests are approximately 1-meter in size and can be found in either hardwood or softwood trees. Nests are generally located in the tops of trees to avoid predators, but multiple nests can be found in a single tree.

downstream nest was located on the northeast shore of the river, approximately one mile from the proposed crossing. This nest is likely an alternate location for the known bald eagle nest mapped on the west side of the river (MDIFW Nest #190). One adult bald eagle was seen in the nest in an incubating position. Stantec also located an old bald eagle nest on the west side of the river, which matched the location of Nest #190. Stantec observed a pair of great horned owls (*Bubo virginianus*) occupying the old bald eagle nest. The upstream bald eagle nest was located approximately two miles from the proposed crossing and was also found to be active with one adult bald eagle observed in the nest in an incubating position. This nest location corresponds to a known nest mapped by MDIFW (Nest #387). Stantec observed two adult bald eagles and one sub-adult bald eagle flying in the vicinity of the existing dam on the Penobscot River, just upstream of the proposed crossing location. Stantec also located a known bald eagle nest on Molunkus Lake (MDIFW Nest #299) and found the nest to be active with an adult bald eagle sitting in the nest, possibly in a brooding position. No other bald eagles or nests were observed in or adjacent to the Project corridor.

Stantec identified 11 osprey nests along the proposed project corridor. Each osprey nest was located on existing poles associated with the Maine Electric Power Company (MEPCO) transmission line. Ten of the 11 nests were found to be active with adult osprey sitting on the nests in an incubating position. One of the active nests contained a hatched chick. The locations of the nests are shown on Figure 1. No great blue heron rookeries were observed in the project area. Stantec also observed a northern harrier (*Circus cyaneus*) flying along the edge of a large wetland within the existing MEPCO right-of-way in Glenwood Plantation. Northern harrier is listed as a Species of Special Concern by MDIFW.

During the second flight, Stantec surveyed the active bald eagle nest locations identified during the first flight. At the Penobscot River crossing, the nest downstream of the crossing (Nest #190) was active with two eaglets observed in the nest and an adult bald eagle perched next to the nest. The nest upstream of the crossing (Nest #387) was active with at least one eaglet in the nest and an adult eagle perched next to the nest. Nest 299 on Molunkus Lake was found to be empty, and no eaglets or adult eagles were seen in or near the nest. Stantec surveyed another known nest located in the Reed Deadwater along Macwahoc Stream (MDIFW Nest #550). The nest was active with one eaglet observed in the nest and an adult eagle perched at the nest. No new osprey nests or heron rookeries were observed during the second flight.

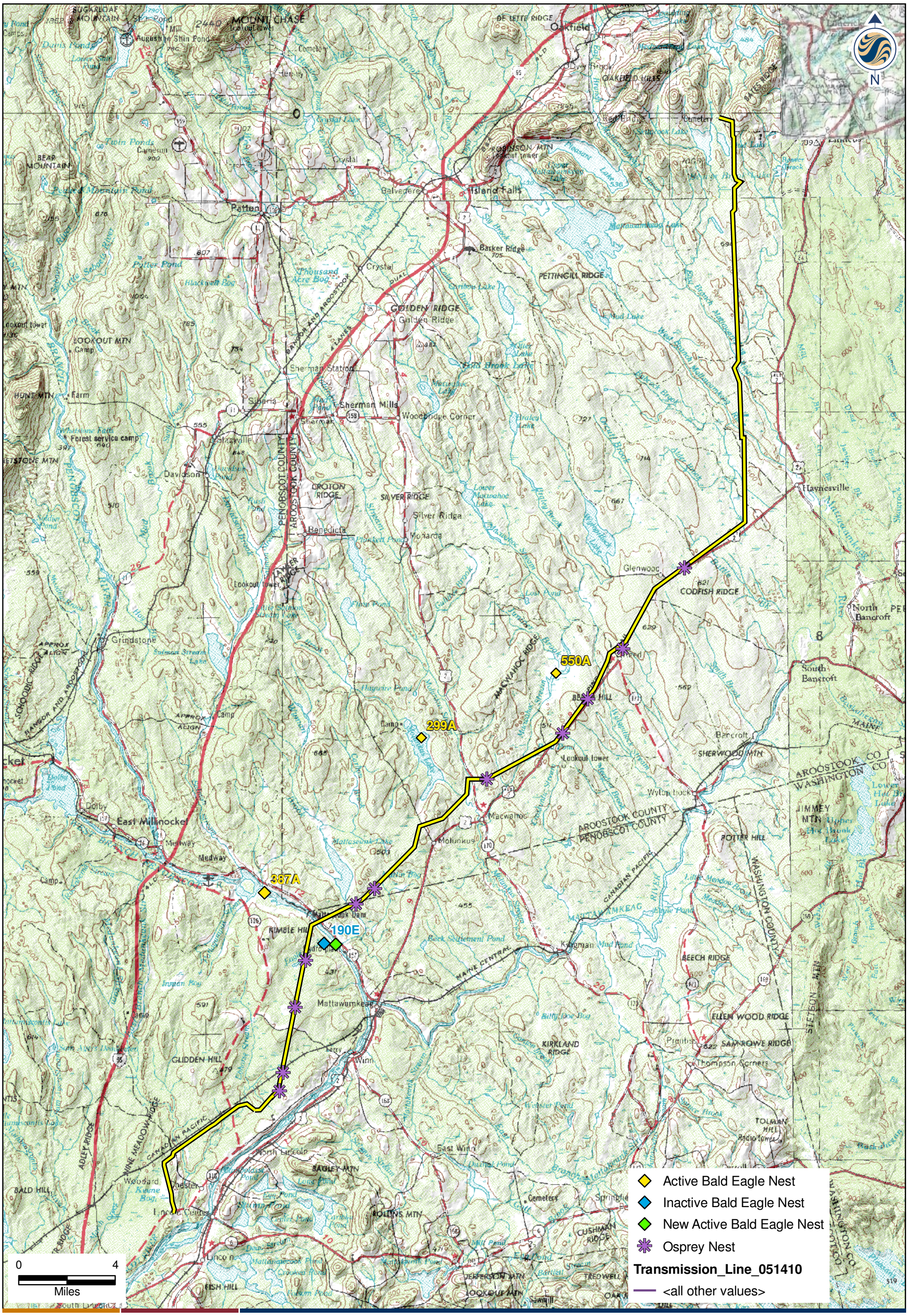
Please contact our office if you have any questions regarding the information presented in this report or if we can be of further assistance.

STANTEC CONSULTING

Bryan Emerson

Bryan Emerson
Project Manager/Wetland Scientist

Cc: Robert Roy, First Wind
Brooke Barnes, Stantec
File 195600518



195600518

Stantec Consulting Services Inc.
30 Park Drive
Topsham, ME USA
04086
Phone (207) 729-1199
Fax: (207) 729-2715
www.stantec.com

00518-F01-TLineEagleSurveySpring2010.mxd

Client/Project
Maine GenLead, LLC
115kV Transmission Line
Aroostook and Penobscot Counties, Maine

Figure No.
1

Title
Oakfield Transmission Line Eagle Survey

6/22/2010

Appendix 7-5
DWA Survey Report
Maine GenLead 115kV Transmission Line, May 2010

Maine GenLead, LLC
Proposed 115kV Transmission Line Project
Penobscot County and Aroostook County, Maine

Evaluation of Mapped Deer Wintering Areas along a Proposed Transmission Line Corridor

May 2010

PREPARED FOR:
First Wind
1 Dana Street
Portland, ME 04101

PREPARED BY:
Stantec Consulting
30 Park Drive
Topsham, ME 04086

Summary

Maine GenLead, LLC proposes to construct an approximately 60-mile transmission line extending from a wind power project in Oakfield, Maine to a substation in Chester (Figure 1). Along its route, the proposed transmission line will intersect portions of nine mapped Deer Wintering Areas (DWAs). These include DWAs mapped by the Maine Department of Inland Fisheries and Wildlife (MDIFW, areas zoned as P-FW Subdistricts by the Maine Land Use Regulation Commission, and areas identified by MDIFW as part of a management agreement between Fraser Papers (Fraser) and the MDIFW.

In 2009 and 2010, Stantec Consulting (Stantec) conducted DWA evaluations within portions of the nine DWAs that might be affected by the proposed transmission line. This survey effort included establishing transects within a 0.25-mile area associated with the proposed transmission line. Transects were conducted during appropriate deer wintering conditions as outlined in the DWA and Travel Corridor MDIFW guidance document (December 22, 1993).

In 2010, where the proposed transmission line intersects an edge of a DWA or where the proposed transmission line parallels an existing transmission line corridor (e.g., MEPCO or Line 56 corridors), surveys were conducted within a 0.25-mile zone where landowner permission was granted to provide assessments of forest cover and habitat connectivity within the vicinity of the proposed transmission line. This approach was consistent with Stantec's 2009 survey effort. In areas where the proposed transmission line intersects interior portions of the DWA (e.g., away from an existing transmission line corridor or away from the edge of the DWA), a more robust survey effort was conducted to characterize the existing forest cover and provide analyses of habitat connectivity within the DWA.

Three MDIFW mapped DWAs in Mattawamkeag, Woodville, and Chester are not presently functioning as DWAs. Past and ongoing timber management activities within these areas have substantially affected the ability of the areas to function as DWAs by removing suitable softwood shelter stands and fragmenting travel corridors through the creation of logging roads and skidder trails.

Three DWAs in Glenwood Plantation, Reed Plantation (South), and T3R3 WELS (North), have sporadic and limited conforming cover. In these three locations, the proposed transmission line is located along the periphery of the DWA or adjacent to the existing MEPCO corridor, minimizing fragmentation of the DWA.

Three DWA's in T3R3 WELS (South), Reed Plantation (North), and Macwahoc Plantation have conforming softwood cover which may be reduced by the transmission line corridor. Only one plot in T3R3 WELS (south) had evidence of deer usage, and no plots in Reed Plantation (North) had evidence of deer usage. The Macwahoc Plantation DWA had the highest abundance of deer use and presently includes suitable softwood stands that are being utilized by wintering deer. The establishment of a permanent treeless corridor through this area has the potential to fragment travel corridors and reduce the available softwood cover present within these DWAs unless mitigating measures are implemented.

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PN 195600518

1.0 INTRODUCTION AND PROJECT BACKGROUND

Maine GenLead, LLC proposes to construct an approximately 60-mile transmission line extending from a wind power project in Oakfield, Maine to a substation in Chester. The transmission line will extend southerly along the eastern boundary of T4 R3 WELS, T3 R3 WELS, and Glenwood Plantation. In Glenwood Plantation, the proposed transmission line will continue southwesterly and largely parallel to the existing Maine Power Connection (MEPCO) 345-kilovolt transmission line, as well as portions of the Stetson Mountain Line 56 transmission line, to a substation in Chester. Along its route, the proposed transmission line will intersect portions of nine mapped Deer Wintering Areas (DWAs). These include DWAs identified from three sources: areas mapped by the Maine Department of Inland Fisheries and Wildlife (MDIFW) under the Natural Resources Protection Act; areas zoned as P-FW Subdistricts by the Maine Land Use Regulation Commission (LURC); and areas identified as part of a management agreement between Fraser Papers (Fraser) and the MDIFW (Figure 1). These include the following locations:

- T3 R3 WELS (North), LURC P-FW #100071 (Figure 2);
- T3 R3 WELS (South), LURC P-FW #100068 (Figure 3);
- Glenwood Plantation, Fraser DWA #992801 (Figure 4);
- Reed Plantation (North), Fraser DWA #992202 (Figure 5);
- Reed Plantation (South), Fraser DWA #992301 (Figure 6);
- Macwahoc Plantation, Fraser DWA # 991502 (Figure 7);
- Mattawamkeag, MDIFW DWA # 100195 (Figure 8);
- Woodville, MDIFW DWA #100198 (Figure 9); and
- Chester, MDIFW DWA #100112 (Figure 10).

The MDIFW identifies and regulates DWAs throughout Maine. DWAs provide important refuge for white-tailed deer (*Odocoileus virginianus*) during the winter months in northern climates (Moen 1968, Moen 1978, MDIFW 1990, Lavigne 1999). DWAs are typically characterized by an extensive forest stand of mature softwood species with a dense forest canopy. In Maine, such areas typically include stands of eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), or red spruce (*Picea rubens*), as well as forested wetlands dominated by northern white cedar (*Thuja occidentalis*) or black spruce (*Picea mariana*). During the cold winter months (i.e., average daily temperatures below 32 degrees Fahrenheit) and deep snow conditions (i.e., greater than 12 inches), deer will congregate or “yard-up” within these areas. DWAs provide shallower snow depths allowing for more efficient travel for foraging and avoiding predators, as well as provide thermal protection from wind chill.

2.0 SURVEY METHODOLOGY

Stantec conducted DWA evaluations in 2009 and 2010. In March 2009, Stantec conducted DWA evaluations within portions of the DWAs in Chester, Woodville, Mattawamkeag, Macwahoc Plantation, and Reed Plantation that were intersected by the preliminary transmission line route. Through consultation with MDIFW Region F biologists, this survey effort included establishing transects within a 0.25-mile area associated with the proposed transmission line. A 0.25-mile zone was chosen, as the proposed transmission line is co-located with existing transmission lines (i.e., existing permanent habitat fragmentation features) along much of its length. Transects were largely established along the proposed centerline of the transmission line, as well as within a 0.25-mile zone on either side of the proposed corridor. Transects within the 0.25-mile zone were oriented to provide sufficient coverage to accurately characterize the existing canopy cover and deer use within that zone. Transects were conducted during appropriate deer wintering conditions as outlined in the DWA and Travel Corridor MDIFW guidance document (December 22, 1993). Along each transect, data were collected on forest stand type, deer use, and general landscape characteristics along 2-chain (i.e., 132 feet) intervals using the standard MDIFW DWA data collection form. Plot location points were loaded onto a Garmin eTrex handheld Global Positioning System (GPS) receiver to allow for accurate navigation along the transects.

In 2009, the transmission line alignment was finalized. The final alignment includes additional intersections with DWAs in T3 R3 WELS, Glenwood Plantation, Reed Plantation, and Macwahoc Plantation. These areas were surveyed and characterized during 2010 surveys.

Prior to March 2010 DWA surveys, a survey plan was prepared and submitted to the MDIWF for their review and comment (Appendix A). The portions of the DWAs surveyed in 2009 were not revisited in 2010. These include Reed Plantation DWA #992301 (Figure 6), Mattawamkeag DWA #100195 (Figure 8), Woodville DWA #100198 (Figure 9), and Chester DWA #100112 (Figure 10).

The survey methodology for 2010 was consistent with the 2009 effort. Where the proposed transmission line intersects an edge of a DWA or where the proposed transmission line parallels an existing transmission line corridor (e.g., MEPCO or Line 56 corridors), surveys were conducted within a 0.25-mile zone where landowner permission was granted to provide assessments of forest cover and habitat connectivity within the vicinity of the proposed transmission line. In areas where the proposed transmission line intersects interior portions of the DWA (e.g., away from an existing transmission line corridor or away from the edge of the DWA), a more robust survey effort was conducted to characterize the existing forest cover and provide analyses of habitat connectivity within the DWA. Within the survey areas, transects were oriented to provide sufficient coverage to characterize forest cover types, following the guidelines in the DWA and Travel Corridor MDIFW guidance document (December 22, 1993). This included orienting a transect along the centerline of the proposed transmission line corridor. Data were collected along 2-chain intervals of forest stand type, evidence of wintering deer use, and general landscape characteristics.

3.0 SURVEY RESULTS AND DISCUSSION

Stantec completed surveys from March 19 through March 27, 2009, and March 8 through March 10, 2010. Representative photographs are included in Appendix B. Completed data forms for each transect are included in Appendix C. The following sections provide the results of the field surveys and present a characterization of the existing forest conditions within each DWA in the vicinity of the proposed ROW.

3.1 T3R3 WELS, NORTH AND SOUTH DWAS

On March 10, 2010, Stantec completed surveys within 2 DWAs in T3R3 WELS. Both DWAs are within LURC P-FW Subdistricts.

T3R3 WELS North
In 2010, 3 transects and 35 plots were established within a 0.25-mile zone in the vicinity of the proposed transmission line within the DWA (#100071) north of Beaver Brook and west of the Forkstown Township line (Figure 2). As a result of the field surveys, 21 of the plots (60%) contained conforming DWA canopy cover (e.g., stands with tree heights 35 feet or taller and canopy closures of more than 50%). In addition, three of the plots along the proposed transmission line contained evidence of deer use. The western-most transect contained the highest proportion of suitable DWA forest cover. Portions of the transects in the vicinity of the proposed transmission line have been affected from past timber harvests and are presently characterized by an open canopy forest with very dense regeneration of balsam fir (*Abies balsamea*) and red spruce shrubs and saplings within the forest understory.

Within the proposed transmission line corridor (Transect 1), four of the eight plots surveyed presently contain suitable softwood forest cover, with three plots containing evidence of deer use. The proposed transmission line corridor will create a permanently treeless corridor along the eastern edge of the DWA. Although the proposed transmission line will remove suitable softwood forest cover, it will minimize impacts to deer travel corridors and fragmentation impacts because it is located along the eastern periphery of the DWA and avoids the interior potions of the DWA to the west, which contain a higher proportion of softwood forest cover.

T3R3 WELS South

In 2010, 2 transects and 18 plots were established within a 0.25-mile zone in the vicinity of the proposed transmission line within the DWA (#100068) in T3R3 WELS (Figure 3). As a result of the field survey, 17 of the plots (94%) contained conforming DWA forest cover. In addition, one plot on the northern edge of the DWA within the proposed transmission line corridor contained evidence of deer use, including tracks, a pellet group, and a bed. Suitable DWA forest cover continued for approximately 1,000 feet north of the existing DWA boundary along the proposed transmission line corridor. Although Stantec did not have landowner permission to conduct field surveys within the portion of the DWA in Haynesville, an analysis of available aerial photographs from the Maine Geographic Information System (MEGIS) indicates that most of the DWA in Haynesville is dominated by mixed and early successional stands that have been affected from past timber harvests. Presently, these areas largely do not provide suitable DWA forest cover based on the aerial photo evidence. Several old logging road beds are evident within this DWA in Haynesville. The aerial photographs indicate that a narrow band of red spruce and hemlock extends along the banks of the West Branch of the Mattawamkeag River southwest of the proposed transmission line. This narrow corridor appears to provide suitable softwood cover, as well as a potential deer travel corridor along the river bank.

Within the proposed transmission line corridor (Transect 1), six of the seven plots surveyed presently contain suitable softwood forest cover, with one plot containing evidence of deer use. Based on Stantec's field survey, contiguous softwood forest stands extend to the west of the proposed transmission line. In addition, a narrow band of softwood cover extends to the southeast along the West Branch of the Mattawamkeag River, creating a suitable travel corridor between the DWA in T3R3 WELS and Haynesville. The proposed transmission line has the potential to remove suitable softwood DWA forest cover and create a permanent treeless corridor through the DWA, thereby fragmenting the suitable deer travel corridor within this area. Stantec recommends utilizing taller poles and a DWA specific vegetation management plan to retain portions of suitable softwood shelter to allow deer movement across the transmission line corridor.

3.2 Glenwood Plantation DWA

The proposed transmission line abuts the western edge of the Glenwood Plantation DWA (Fraser #992801) along the Haynesville town line (Figure 4). Stantec surveyed 1 transect with 25 plots along the western edge of the DWA and within the proposed transmission line corridor on March 8, 2010. As a result of the field survey, two plots (8%) contained conforming DWA cover. In addition, two plots contained evidence of deer use. Historic browse was evident on northern white cedar trees and shrubs along the transect. The forests along the transect included softwood-dominated northern white cedar and black spruce forested wetlands and woodlands with an open canopy. Past timber harvests have occurred in portions of the forested wetlands. Landowner permission was not obtained for the portion of the DWA that is located within Haynesville. However, based on a review of the available aerial photographs from MEGIS, the area extending to the east of the proposed transmission line is dominated by similar softwood-dominated forested wetlands, including black spruce and northern white cedar forests and woodlands along Alder Brook. Recent timber harvesting is evident within this DWA.

The proposed transmission line corridor will create a permanently treeless corridor along the western edge of the DWA. Although the proposed transmission line will remove suitable softwood forest cover, it will minimize impacts to deer travel corridors and fragmentation impacts because it is located along the western periphery of the DWA and avoids the interior potions of the DWA to the east in Haynesville, which contain a higher proportion of softwood forest cover based on a review of available aerial photographs.

3.3 Reed Plantation, North and South DWAs

The two DWAs in Reed Plantation are managed under Fraser's cooperative agreement with the MDIFW. Stantec conducted initial field surveys within the DWAs on March 23, 2009. In 2010, the proposed transmission line was altered through the northern Reed Plantation DWA (Fraser #992202). As a consequence, Stantec conducted additional surveys within this DWA on March 8, 2010.

Reed Plantation North
In 2009, two transects and 51 plots were established in the northern DWA (Fraser #992202; Figure 5). As a result of the field surveys, 7 of the plots (14%) contained conforming DWA cover. However, no plots contained evidence of winter use by deer at the time of the field survey. Most plots along the transects are characterized as regenerating softwood and mixed stands with an open canopy as a result of past timber harvests. Dominant vegetation includes balsam fir, quaking aspen (*Populus tremuloides*), northern white cedar, and red spruce. Residual mature red spruce and hemlock trees are scattered throughout the transects.

In 2010, six additional transects and 143 plots were established between the proposed transmission line corridor and an unnamed road that bisects the. As a result of the 2010 field surveys, 54 of the 143 plots (38%) contained conforming DWA cover. At the time of the field survey, no plots contained evidence of recent deer use. Suitable softwood cover within the DWA is characterized by mature hemlock and red spruce trees within upland areas and forested wetlands dominated by northern white cedar. It is important to note that restrictive snow conditions for deer were marginal in 2010. There had not been any significant snowfall within the area in more than 3 weeks before the 2010 field surveys were conducted.

Second-growth and residual softwood-dominated stands that have been affected from past timber harvests were present throughout the DWA, including the proposed transmission line corridor. The area could potentially provide suitable DWA cover in the future as the forests mature.

Within the proposed transmission line corridor (2010 Transect 1), 6 of the 30 plots surveyed in 2010 contained suitable DWA softwood cover. The proposed line intersects second growth and early successional forests with residual softwood cover. While past timber harvests have affected the present forest cover within the vicinity of the proposed transmission line, the abundance of softwood present in the regenerating forests indicates that suitable DWA cover could be achieved in the future with proper management. The proposed transmission line has the potential to remove softwood forest cover and create a permanent treeless corridor through the DWA. The proposed transmission line also has the potential to fragment travel corridors within the DWA, as portions of the proposed transmission line bisect interior portions of the DWA. Stantec recommends utilizing taller poles and a DWA specific vegetation management plan to retain portions of suitable softwood shelter to allow deer movement across the transmission line corridor.

Reed Plantation South
In 2009, two transects and 33 plots were established in the southern DWA in Reed Plantation (Fraser #992301; Figure 6). As a result of the field surveys, 12 of the plots (36%) contained conforming DWA forest cover. However, none of the plots contained evidence of winter use by deer at the time of the field survey. The suitable DWA forest cover was predominantly located to the west of the proposed transmission line (Transect 4, Chains 10-19). This area is characterized by a late successional stand of red spruce and hemlock along Wytopitlock Stream. Along the proposed transmission line corridor, the forest is an early successional mixed forest with an open canopy as a result of past selective timber harvests.

Within the proposed transmission line corridor (Transect 1), none of the plots surveyed in 2009 contained suitable DWA forest cover. In addition, five of the nine plots along the proposed transmission line corridor are hardwood-dominated stands and are unlikely to develop suitable DWA softwood cover in the future without specific management prescriptions. The existing MEPCO transmission line bisects the DWA and fragments eastern portions of the DWA along Wytopitlock Stream from western portions. The proposed transmission line will create a permanent treeless corridor through the DWA adjacent to the MEPCO corridor. However, the proposed transmission line minimizes impacts to the DWA by avoiding contiguous stands of suitable softwood shelter in the western portion of the DWA. In addition, the location of the proposed transmission adjacent to the existing MEPCO transmission line minimizes the potential impacts of fragmentation within the DWA.

3.4 MACWAHOC PLANTATION DWA

The Macwahoc Plantation DWA (Fraser #991502) is managed under Fraser's cooperative agreement with the MDIFW. Field surveys were conducted by Stantec on March 24, 2009, along three transects in the southern portion of the DWA. The proposed transmission line alignment was altered in 2010, resulting in additional areas of proposed impact (Figure 7). As a consequence, Stantec conducted field surveys in 2010 throughout the Fraser DWA in Macwahoc.

In 2009, a total of 110 plots were established along the 3 transects within the southern portion of the DWA adjacent to the MEPCO corridor. As a result of the 2009 field surveys, 8 of the 110 plots (7%) contained conforming DWA forest cover. In addition, 25 of the plots (23%) contained evidence of deer use, including tracks, pellet clumps, trails, and beds. The plots within the forested northern white cedar-dominated floodplain along Molunkus Stream contained the most abundant evidence of recent winter use by deer. At the time of the 2009 field survey, snow depths averaged approximately 30 inches within open areas and between 20 and 30 inches deep under forest cover.

In 2010, an additional 295 plots were established along 6 additional transects in 2010. As a result of the 2010 field surveys, 136 of the 295 plots (46%) contained conforming DWA cover. In addition, 134 of the plots (45%) contained evidence of deer use. It is important to note that restrictive snow conditions for deer were marginal in 2010. At the time of the 2010 field surveys, deer sinking depths were generally less than 6 inches within open forests and under softwood cover. Snow depths were generally less than 18 inches deep. There had not been any significant snowfall within the area in more than 3 weeks prior to the 2010 field surveys.

While the majority of the forest cover within the DWA is presently non-conforming, the area provides a high proportion of suitable softwood cover, as well as regenerating softwood-dominated stands that could potentially provide suitable forest cover in the future. Second-growth stands with maturing hemlock, red spruce, yellow birch (*Betula alleghaniensis*), and sugar maple (*Acer saccharum*) trees characterize the majority of the upland forested stands within the DWA. Large forested wetland systems are also present within the DWA. These areas are characterized by northern white cedar, balsam fir, red maple (*Acer rubrum*), and black ash (*Fraxinus nigra*). The central portion of the DWA contains hardwood-dominated stands. Past timber harvests have been conducted throughout the DWA.

Within the proposed transmission line corridor (2009 Transect 2, 2010 Transect 1), 8 of the 61 plots contained suitable DWA softwood forest cover. However, deer use was abundant in 2010 and common in 2009 along the proposed transmission line corridor, as well as throughout the DWA. The abundance of deer use throughout the DWA and the availability of softwood cover indicates that the Macwahoc Plantation DWA is a functioning DWA. The proposed transmission line will create a permanent treeless corridor within the DWA. The proposed transmission line will be largely co-located adjacent to the existing MEPCO transmission line that presently bisects the southern portion of the DWA. To the west of the floodplain wetland along Molunkus Stream, the proposed transmission line becomes oriented north-south and traverses an upland, hardwood-dominated ridge west of Molunkus Stream. The co-location of the proposed transmission line adjacent to the MEPCO transmission line for several thousand feet minimizes impacts from fragmentation to the DWA. However, the segment of the proposed transmission line that diverts to the north of the MEPCO corridor has the potential to fragment travel corridors within the DWA that presently exist within the softwood-dominated forest within the floodplain along Molunkus Stream. Stantec recommends utilizing taller poles to retain portions of suitable softwood shelter to allow deer movement across the transmission line corridor.

3.5 MATTAWAMKEAG DWA

The proposed transmission line intersects two small portions of the Mattawamkeag DWA (#100195) on the northern edge of an existing transmission line corridor (Figure 8). Four transects and 34 plots were established on March 19, 2009, within the DWA in the vicinity of the proposed transmission line. As a result of the field surveys, 3 of the 34 plots (9%) contained evidence of deer use, and 5 plots (15%) contained conforming DWA forest cover. The evidence of deer use was limited to old tracks, pellets, and

a trail within a residual mixed forest stand. Snow cover averaged approximately 30 inches deep at the time of the field survey within the open and forested areas.

Within the vicinity of the proposed transmission line corridor, the Mattawamkeag DWA is characterized as mid-successional hardwood-dominated mixed forest stands with an open canopy. Selective timber harvest have occurred throughout the transects resulting in residual mature sugar maple, red spruce, yellow birch, white pine, and hemlock trees scattered within the forest. Suitable DWA cover is present in five plots on Transect 4 in the vicinity of Mattaseunk Stream. However, at the time of the field survey, no evidence of deer use was observed within these conforming stands. As a consequence, the forest stands within the proposed transmission line corridor do not presently function as a DWA.

Within the proposed transmission line corridor (Transects 1 and 3), no plots contained suitable DWA forest cover. In addition, 8 of the 18 plots contained hardwood-dominated stands that are unlikely to develop suitable DWA cover without specific management prescriptions to enhance softwood growth. As such, this portion of the DWA is not presently functioning as a DWA. The principal function of this portion of the DWA is to provide seasonal foraging opportunities for deer during non-restrictive snow or temperature conditions. The proposed transmission line will create a permanent treeless corridor through the northern portion of the DWA. However, impacts to the DWA are minimized by co-locating the proposed transmission line adjacent to the existing MEPCO transmission line corridor and avoiding suitable and potentially suitable DWA softwood-dominated stands, as well as avoiding the interior portions of the DWA south of the existing MEPCO transmission line.

3.6 WOODVILLE DWA

The field surveys within the Woodville DWA (#100198) were completed on March 20, 2009. Seven transects and 310 plots were established in the DWA in the vicinity of the proposed transmission line (Figure 9). As a result of these surveys, only four plots contained evidence of deer activity, including tracks and pellet groups. At the time of the field survey, snow depths averaged approximately 30 inches deep in open and forested areas.

The Woodville DWA in the vicinity of the proposed transmission line is dominated by early successional and regenerating forest stands as a result of past timber harvests. The dominant forest stands have a canopy cover of 50 percent or less and are dominated by understory regeneration of balsam fir and red spruce with residual red spruce, yellow birch, sugar maple, and hemlock trees. Large forested wetland communities, including black spruce bogs and northern white cedar swamps, are present along Transects 4, 5, and 6. Alterations of hydrology by beaver (*Castor canadensis*) activity have resulted in inundation and the subsequent transition of portions of the wetland communities from forested to emergent wetlands. Based on Stantec's field surveys, only 19 of the 310 plots (6%) contain conforming DWA forest cover with mature hemlock and northern white cedar trees. These plots represent residual forest stands widely interspersed within the early successional landscape. Only one of the plots with conforming cover (Transect 7, Chain 9) contained evidence of deer use. However, this stand is not located within the proposed transmission line corridor.

Within the proposed transmission line corridor (i.e., Transects 2 and 5), only 2 of the 110 plots contained conforming DWA cover. There was no evidence of wintering deer use of these conforming plots. Past timber harvests have removed nearly all suitable DWA forest cover within the proposed transmission line corridor. As a consequence, the forest stands within the proposed transmission line corridor do not presently function as a DWA.

The proposed transmission line corridor is located adjacent to the western edge of the existing MEPCO transmission line through the Woodville DWA. Within the proposed transmission line corridor (Transects 2 and 5), only 1 of the 110 plots contained suitable DWA forest cover. In addition, only 2 plots contained evidence of deer use. The forests along the proposed transmission line are early successional and regenerating forests that have been affected by past timber harvests. Residual stands of hemlock and red spruce are present in scattered areas along the proposed transmission line. Based on the 2009 field surveys, the forests within the vicinity of the proposed transmission line are not presently functioning as a

DWA. Furthermore, based on past disturbances within most areas, suitable DWA forest stands are unlikely to develop in the absence of specific management prescriptions. While the proposed transmission line will create a permanent treeless corridor through the DWA, impacts to the DWA are minimized by locating the proposed transmission line adjacent to the existing MEPCO transmission line to minimize fragmentation impacts and avoid suitable DWA softwood-dominated stands.

3.7 CHESTER DWA

The field surveys within the Chester DWA (MDIFW #100112) were completed on March 27, 2009. Six transects and 57 plots were established in the DWA in the vicinity of the proposed transmission line (Figure 10). As a result of these surveys, only one set of deer tracks were observed along the edge of a log landing on Transect 3. At the time of the field survey, snow depths throughout the DWA varied up to 30 inches deep.

The Chester DWA in the vicinity of the proposed transmission line is largely dominated by early successional and second- and third-growth mixed forest stands as a result of past timber harvests. Dominant tree species include trees and saplings of balsam fir, yellow birch, hemlock, sugar maple, and big-toothed aspen (*Populus grandidentata*). In nonconforming stands, tree heights are generally less than 50 feet tall with a canopy closure of less than 50 percent.

Small residual patches of mature forest are present within the DWA in the vicinity of the proposed transmission line. These areas contain hemlock, northern white cedar, and red spruce. Based on the field surveys, 15 of the 57 plots (26%) contained conforming DWA forest cover. However, these forested stands are infrequent and interspersed throughout the larger second- and third-growth early successional landscape in the vicinity of the proposed transmission line. While the forest stands in the vicinity of the proposed transmission line may have once functioned as a DWA, past timber harvests have removed the majority of the suitable shelter for wintering deer.

Based on the Stantec field surveys, the forested stands in the vicinity of the proposed transmission line do not presently function as a DWA.

The proposed transmission line through the Chester DWA is located adjacent to the Line 56 transmission line corridor and railroad bed. The forests in the vicinity of the proposed transmission line corridor are multi-growth and early successional stands that have been impacted as a result of ongoing and past timber harvests. In the vicinity of the proposed transmission line corridor, isolated patches of suitable DWA forest cover are present. However, at the time of the 2009 field survey, there was no evidence of wintering deer use within the suitable forest stands. The forests in the vicinity of the proposed transmission line corridor are not presently functioning as a DWA based on the lack of suitable softwood cover and existing habitat fragmenting features, including a logging road, skidder trails, a railroad corridor, and an existing transmission line corridor. While the proposed transmission line will create a permanent treeless corridor through the DWA, impacts to the DWA are minimized by locating the proposed transmission line adjacent to the existing Line 56 transmission line and railroad corridor. Additionally, locating the proposed transmission line in the vicinity of an existing logging road minimizes fragmentation impacts and avoids suitable DWA softwood-dominated stands.

4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The DWAs surveyed and evaluated by Stantec in 2009 and 2010 vary in their function as DWAs. The DWAs identified as LURC P-FW Subdistricts, including the DWAs in T3R3 WELS, have a greater proportion of suitable DWA cover in the vicinity of the proposed transmission line corridor. The establishment of a permanent treeless corridor through these areas has the potential to fragment travel corridors and reduce the available softwood cover present within these DWAs unless mitigating measures are implemented.

The following Table 1 summarizes the results of the field surveys.

Table 1: DWA Survey Summary

DWA Name	Proportion of Suitable Softwood DWA Shelter within Proposed Corridor	Evidence of Deer Use within the Proposed Corridor	Comments
T3R3 WELS North (#100071)	4 of 8 plots (50%)	3 plots	Proposed corridor is located along eastern edge of DWA, which minimizes impacts to interior portions of DWA.
T3R3 WELS South (#100068)	6 of 7 plots (86%)	1 plot	Proposed corridor has potential to fragment travel corridors; avoidance and minimization efforts, including taller poles and longer spans as well as adjacent forest preservation, will be necessary.
Glenwood Plt. (#992801)	2 of 25 plots (8%)	2 plots	Proposed corridor is located along western edge of DWA, which minimizes impacts to interior portions of DWA.
Reed Plt. North (#992202)	6 of 30 plots (20%)	0 plots	Proposed corridor has potential to fragment travel corridors; avoidance and minimization efforts, including taller poles and longer spans as well as adjacent forest preservation, will be necessary
Reed Plt. South (992301)	0 of 9	0 plots	Proposed corridor is located adjacent to MEPCO corridor, which minimizes impacts to interior portions of DWA.
Macwahoc Plt. (#991502)	8 of 61 plots (13%)	18 plots	Proposed corridor has potential to fragment travel corridors; avoidance and minimization efforts, including taller poles and longer spans as well as adjacent forest preservation, will be necessary in interior portions of DWA.
Mattawamkeag (#100195)	0 of 18	1 plot	Proposed corridor is located adjacent to MEPCO corridor, which minimizes impacts to interior portions of DWA.
Woodville (#100198)	2 of 110 (2%)	2 plots	Proposed corridor is located adjacent to MEPCO corridor, which minimizes impacts to interior portions of DWA.
Chester (#100112)	15 of 57 (26%)	0 plots	Proposed corridor is located adjacent to Line 56 corridor, which minimizes impacts to interior portions of DWA.

The DWAs included under the Fraser management agreement (i.e., Reed Plantation, Glenwood Plantation, and Macwahoc Plantation) have specific management objectives in place for the DWAs. The field surveys conducted by Stantec in 2009 and 2010 indicate that suitable DWA forest cover is sporadic and limited within these DWAs. The Macwahoc Plantation DWA had the highest abundance of deer use and presently includes suitable softwood stands that are being utilized by wintering deer. The establishment of a permanent treeless corridor through this area has the potential to fragment travel corridors and reduce the available softwood cover present within these DWAs unless mitigating measures are implemented.

The DWAs in Mattawamkeag, Woodville, and Chester are not presently functioning as DWAs. Past and ongoing timber management activities within these areas have substantially affected the ability of the areas to function as DWAs by removing suitable softwood shelter stands and fragmenting travel corridors through the creation of logging roads and skidder trails.

The proposed transmission line corridor minimizes impacts to portions of the DWAs because it is located along the periphery of some DWAs (e.g., T3R3 WELS and Glenwood Plantation). The location along the

periphery minimizes the impacts from fragmentation and continues to allow for deer movement through interior portions of the DWA. In addition, in several areas, the proposed transmission line corridor parallels existing transmission line corridors, including portions of the Reed Plantation DWAs, Macwahoc Plantation DWA, Mattawamkeag DWA, Woodville DWA, and Chester DWA. The co-location of the proposed transmission line adjacent to these existing corridors similarly minimizes the fragmenting impacts to interior portions of the DWA.

In the Macwahoc Plantation, Reed Plantation, and T3R3 WELS South DWAs, the proposed transmission line corridor has the potential to remove contiguous softwood shelter and/or fragment existing or potential travel corridors through the DWA. In these instances, mitigation efforts will likely be necessary. These efforts may include utilizing taller poles and narrower clearing limits to allow for the retention of forested cover under the corridor, which will in turn allow for movement of deer across the transmission line corridor during wintering conditions. Additional mitigation considerations may include the preservation of additional forested areas adjacent to the DWAs to be included under DWA forest management objectives.

5.0 LITERATURE CITED

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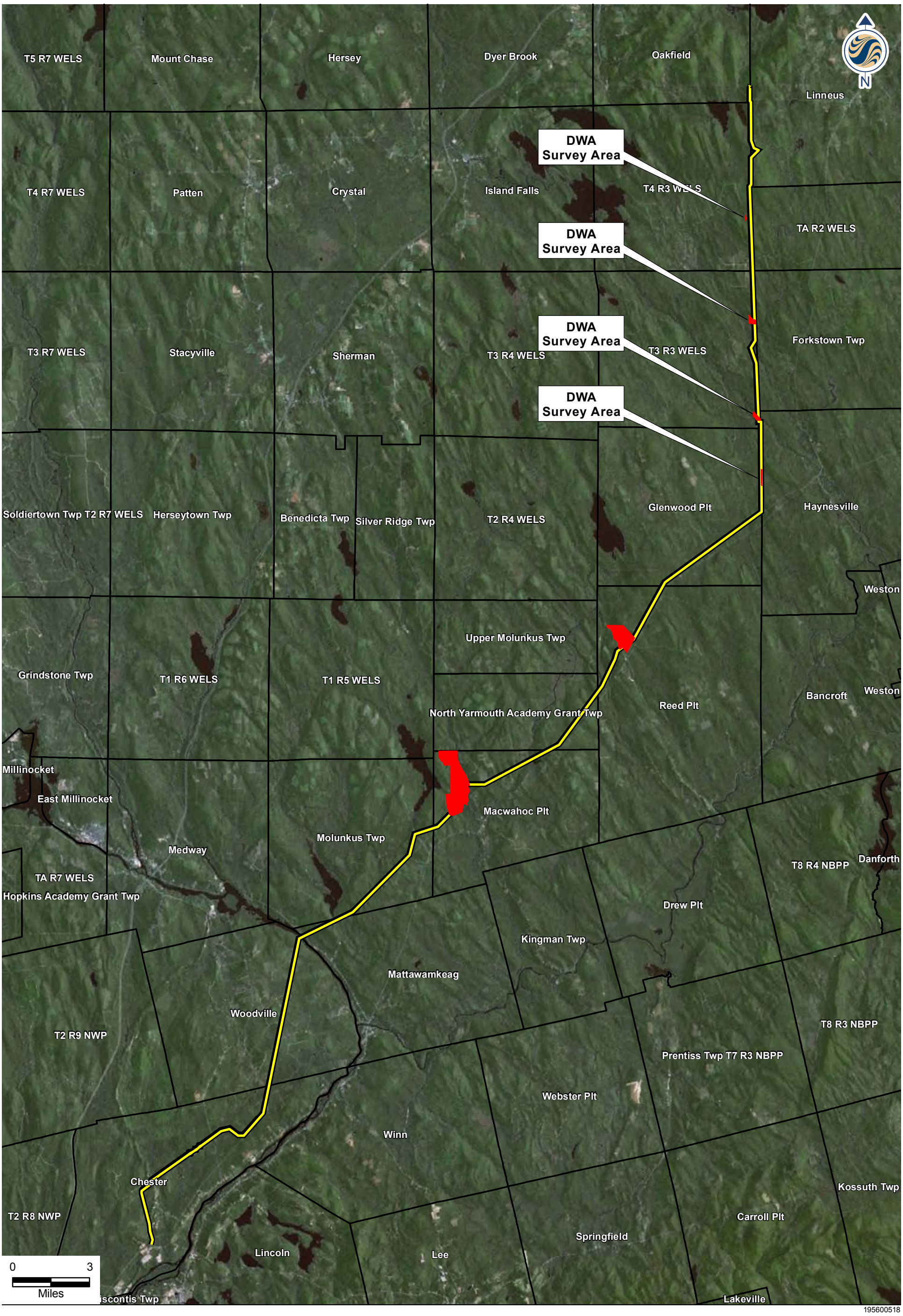
Figures



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Legend

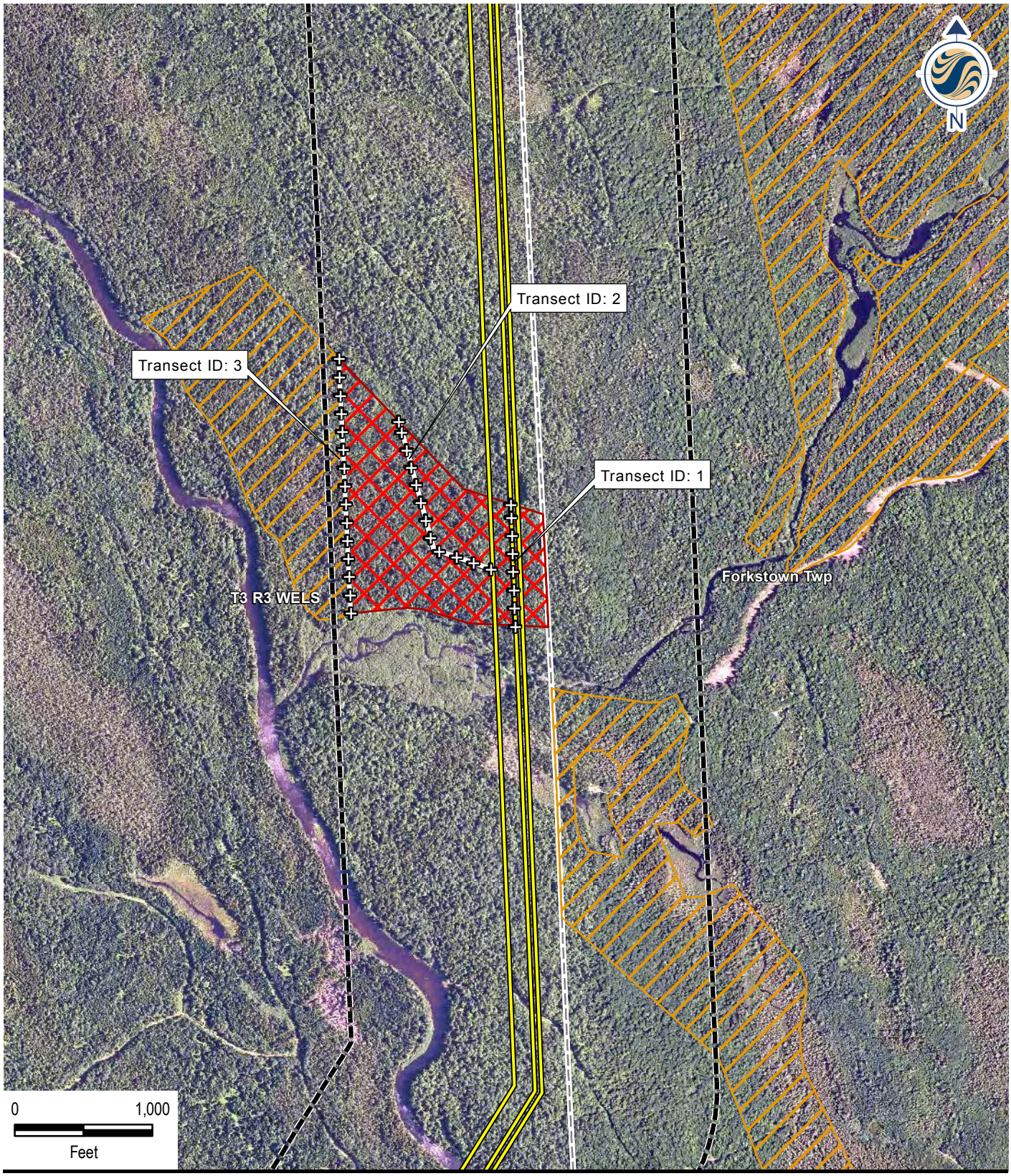
- Proposed Transmission Line (4-14-10)
- 2010 DWA Survey Area
- Town Boundaries

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
1

Title
Deer Wintering Area Survey Locations
April 28, 2010

00518-F001-2010-DWA-Map.mxd



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00518-F002-2010-DWA-Map.mxd

Legend

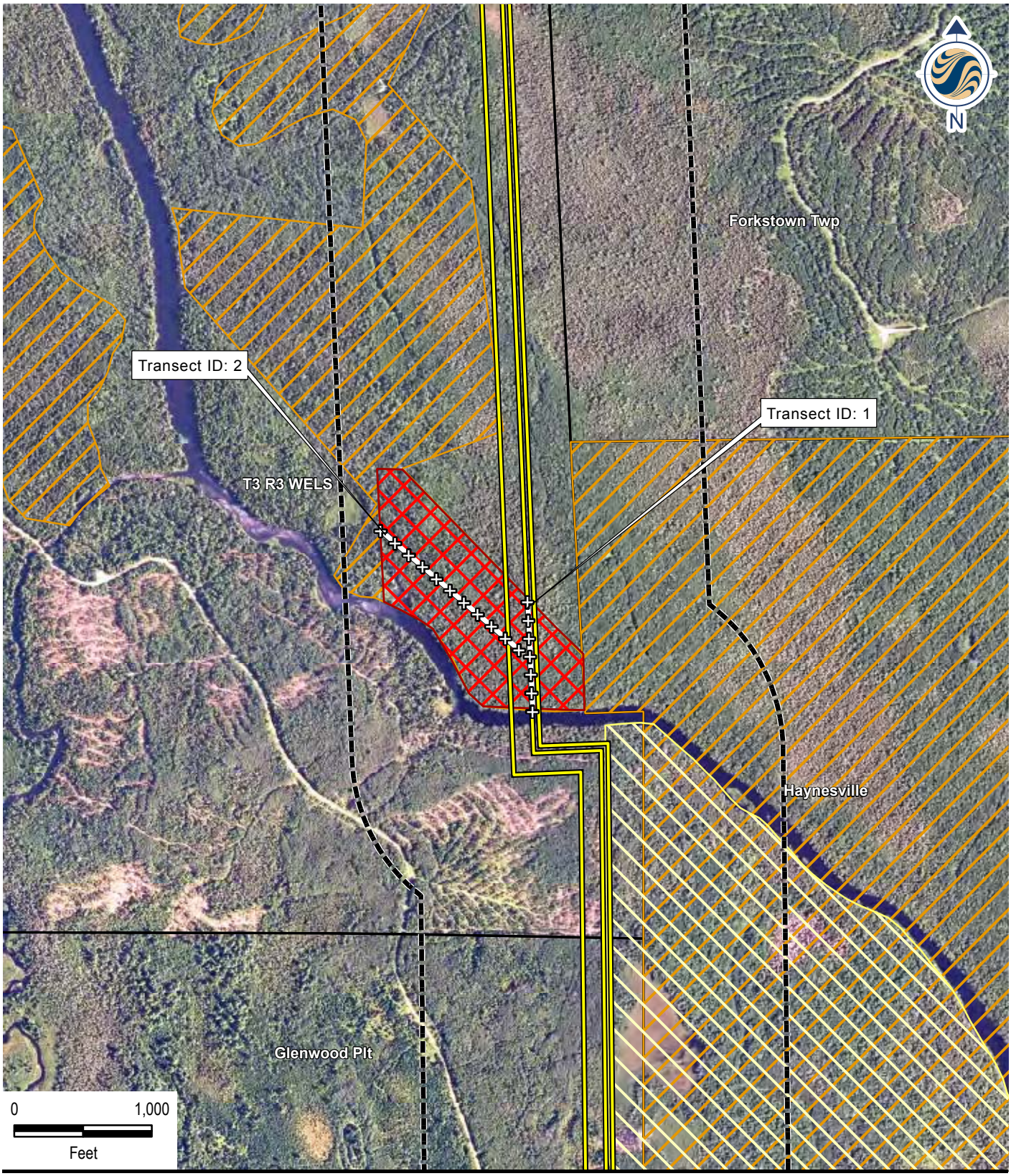
- 2010 DWA Survey Point
- 2010 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
2

Title
T3R3 WELS North Deer Wintering Area #100071

April 28, 2010



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00518-F003-2010-DWA-Map.mxd

Legend

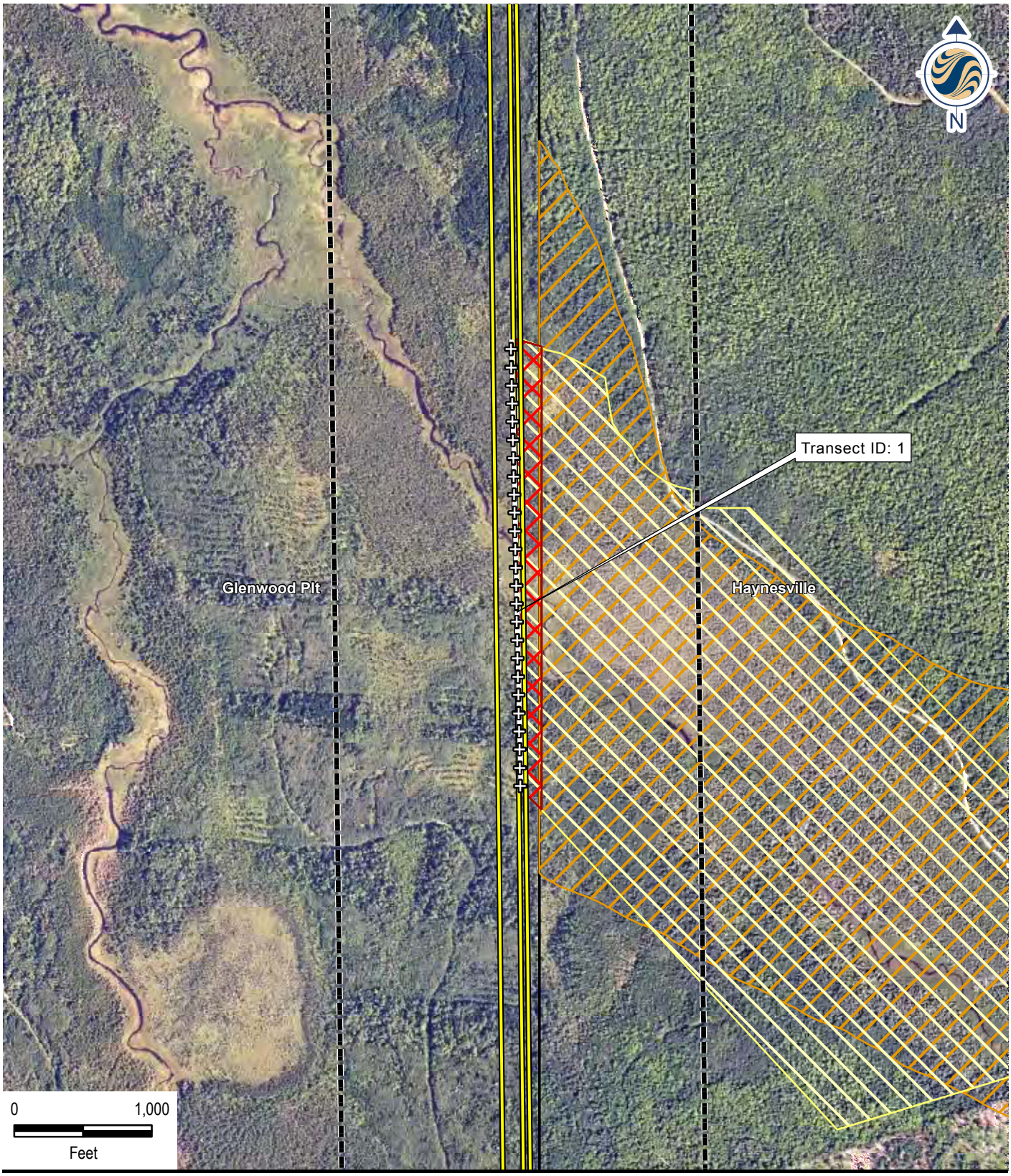
- 2010 DWA Survey Point
- 2010 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- 2010 DWA Survey Area
- Fraser Coop Deer Wintering Area
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
3

Title
T3R3 WELS South Deer Wintering Area # 100068

April 28, 2010



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00518-F004-2010-DWA-Map.mxd

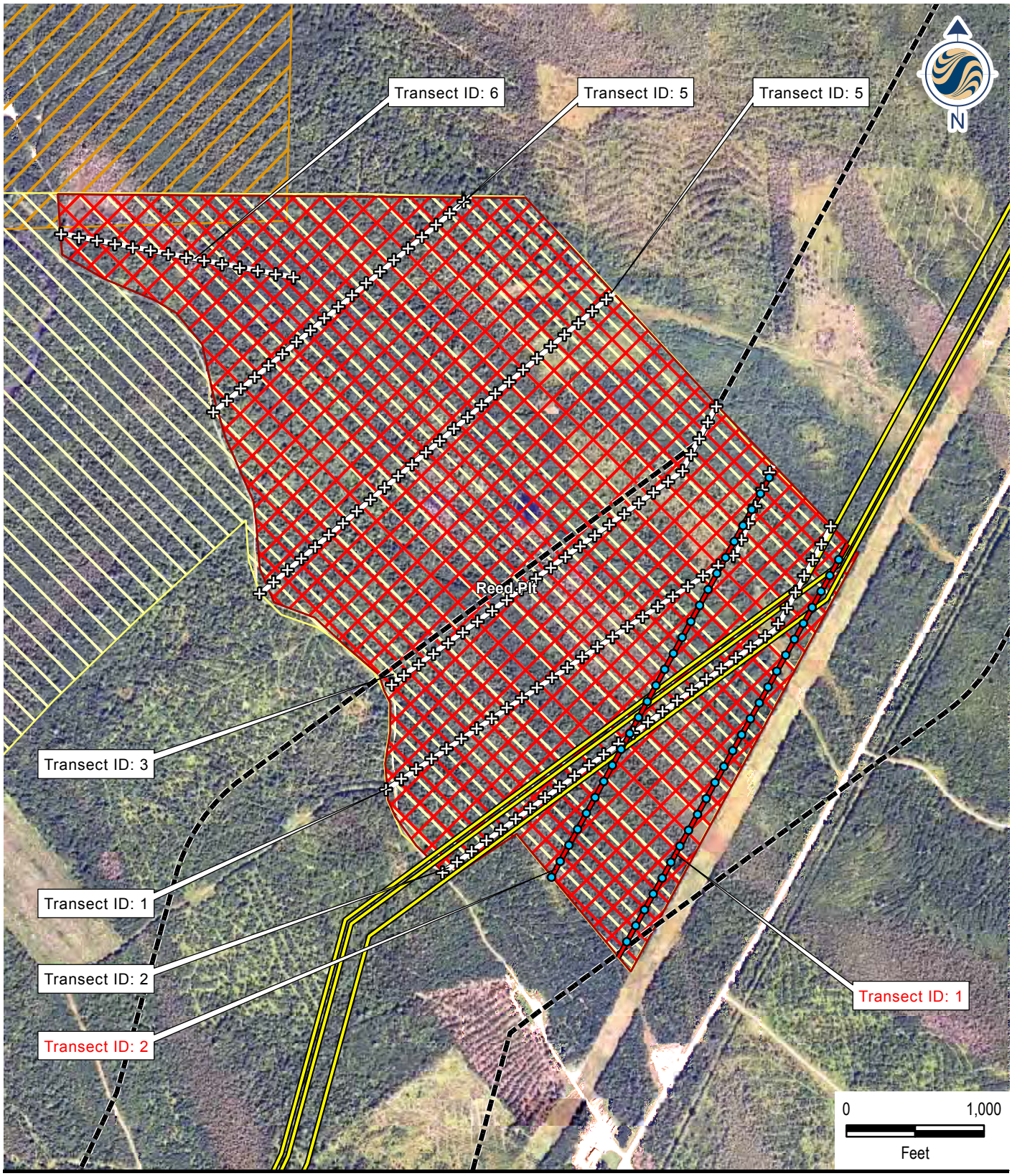
Legend

- 2010 DWA Survey Point
- 2010 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- 2010 DWA Survey Area
- Fraser Coop Deer Wintering Area
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
4

Title
Glenwood Plt. Deer Wintering Area #992801
April 28, 2010



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00518-F005-2010-DWA-Map.mxd

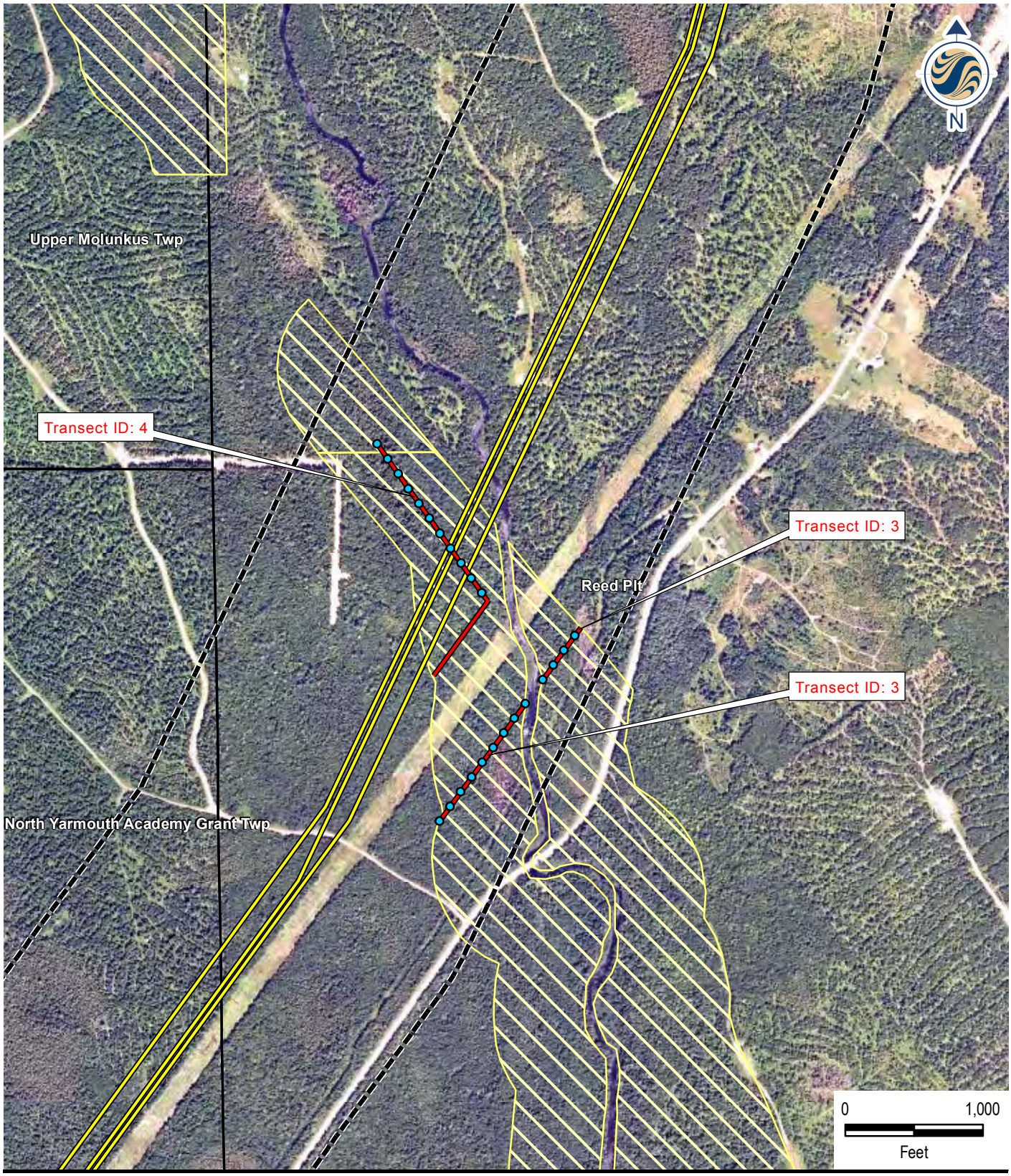
Legend

- 2009 DWA Survey Point
- 2010 DWA Survey Point
- 2009 DWA Transect
- 2010 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- 2010 DWA Survey Area
- Deer Wintering Area
- Fraser Coop Deer Wintering Area
- Town Boundary

Client/Project
Oakfield Wind Project
Oakfield, Maine

Figure No.
5

Title
Reed Plt. North Deer Wintering Area #992202
April 28, 2010



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00518-F006-2010-DWA-Map.mxd

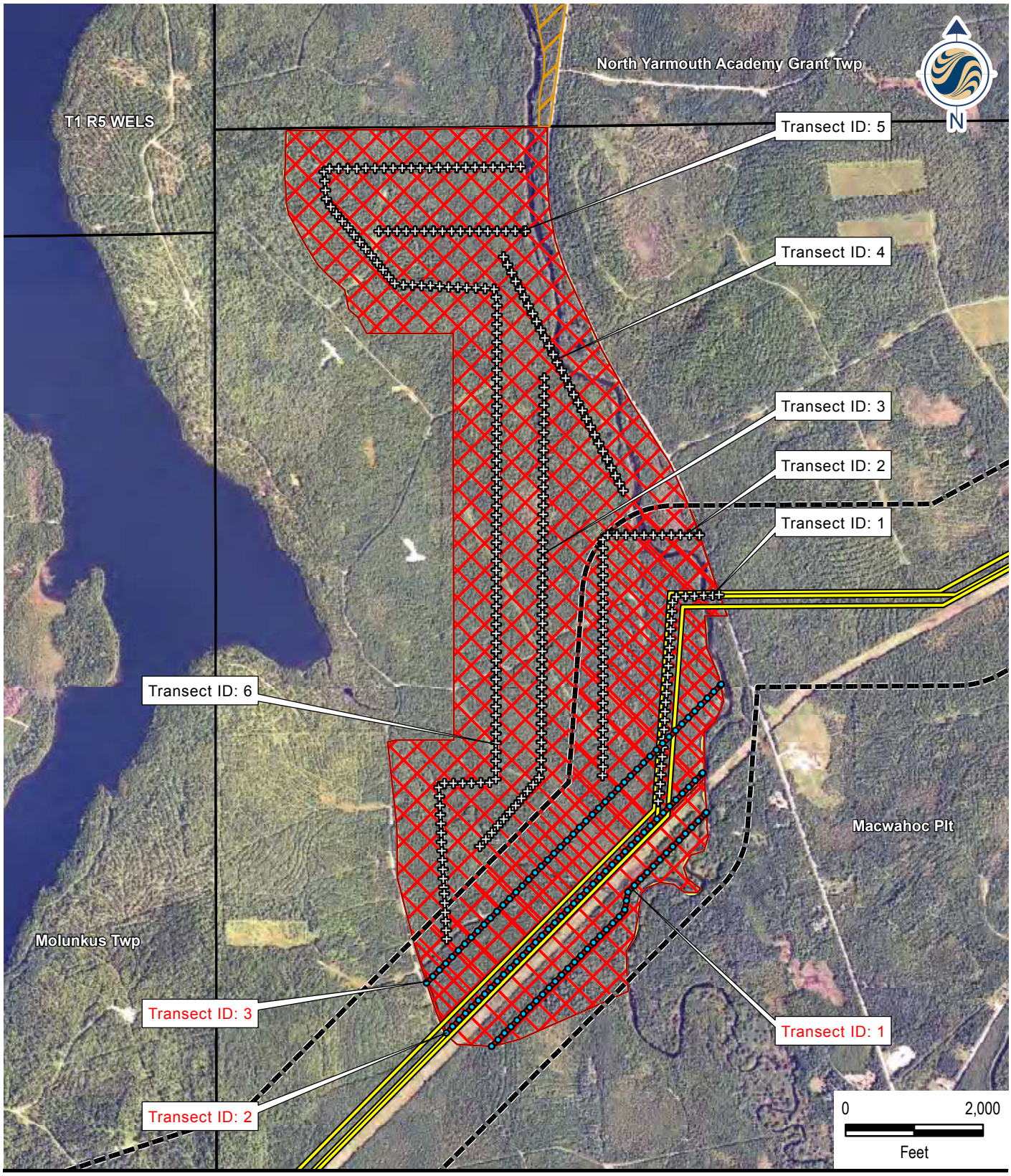
Legend

- 2009 DWA Survey Point
- 2010 DWA Survey Point
- 2009 DWA Transect
- 2010 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- Fraser Coop Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
6

Title
Reed Plt. South Deer Wintering Area #992301
April 28, 2010



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00518-F007-2010-DWA-Map.mxd

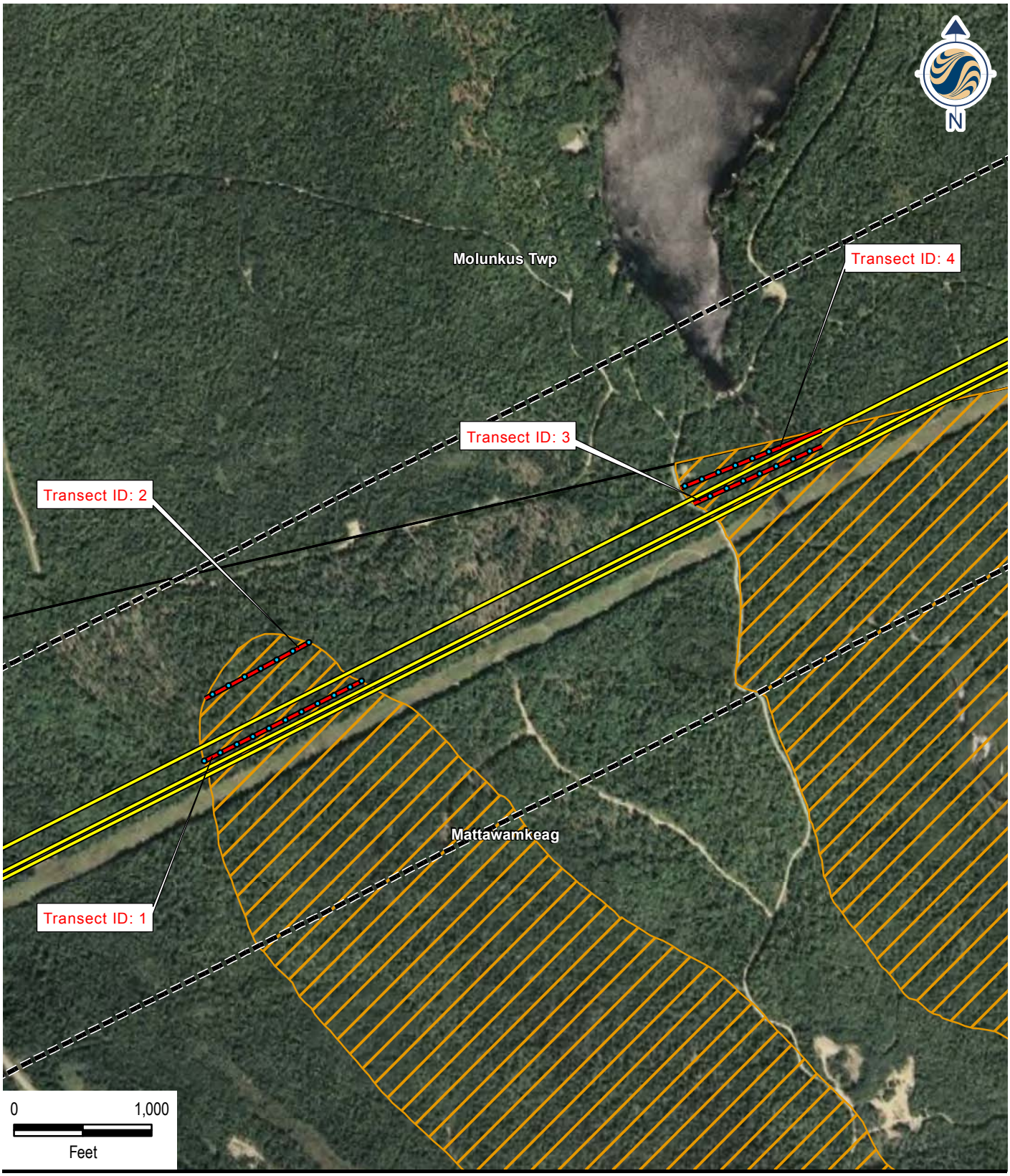
Legend

- 2009 DWA Survey Point
- 2010 DWA Survey Point
- 2009 DWA Transect
- 2010 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- 2010 DWA Survey Area
- Fraser Coop Deer Wintering Area
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
7

Title
Macwahoc Plt. Deer Wintering Area #991502
April 26, 2010



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00518-F008-2010-DWA-Map.mxd

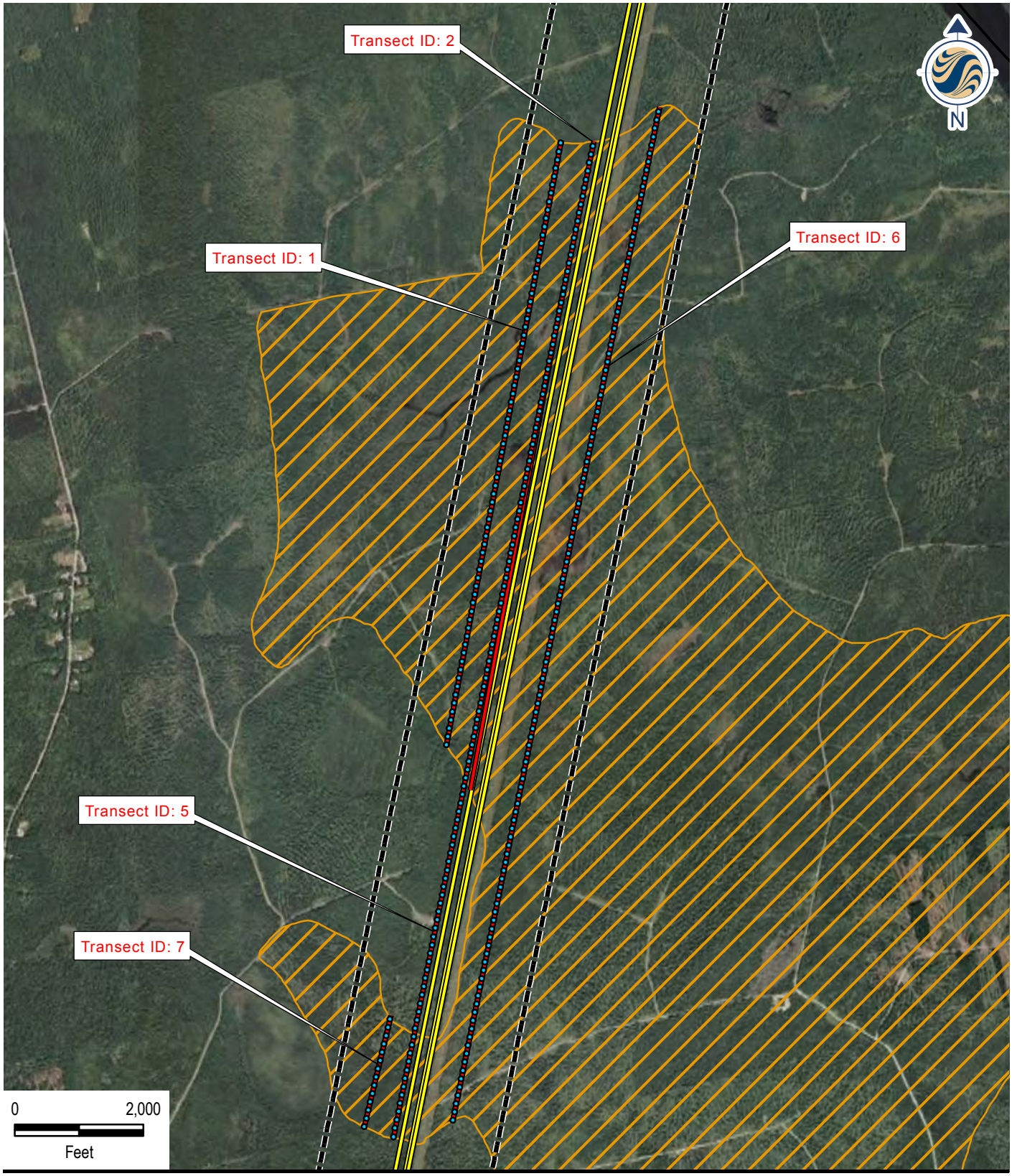
Legend

- 2009 DWA Survey Point
- 2009_DWA_Transect_Locations
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
8

Title
Mattawamkeag Deer Wintering Area #100195
April 28, 2010



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00518-F009-2010-DWA-Map.mxd

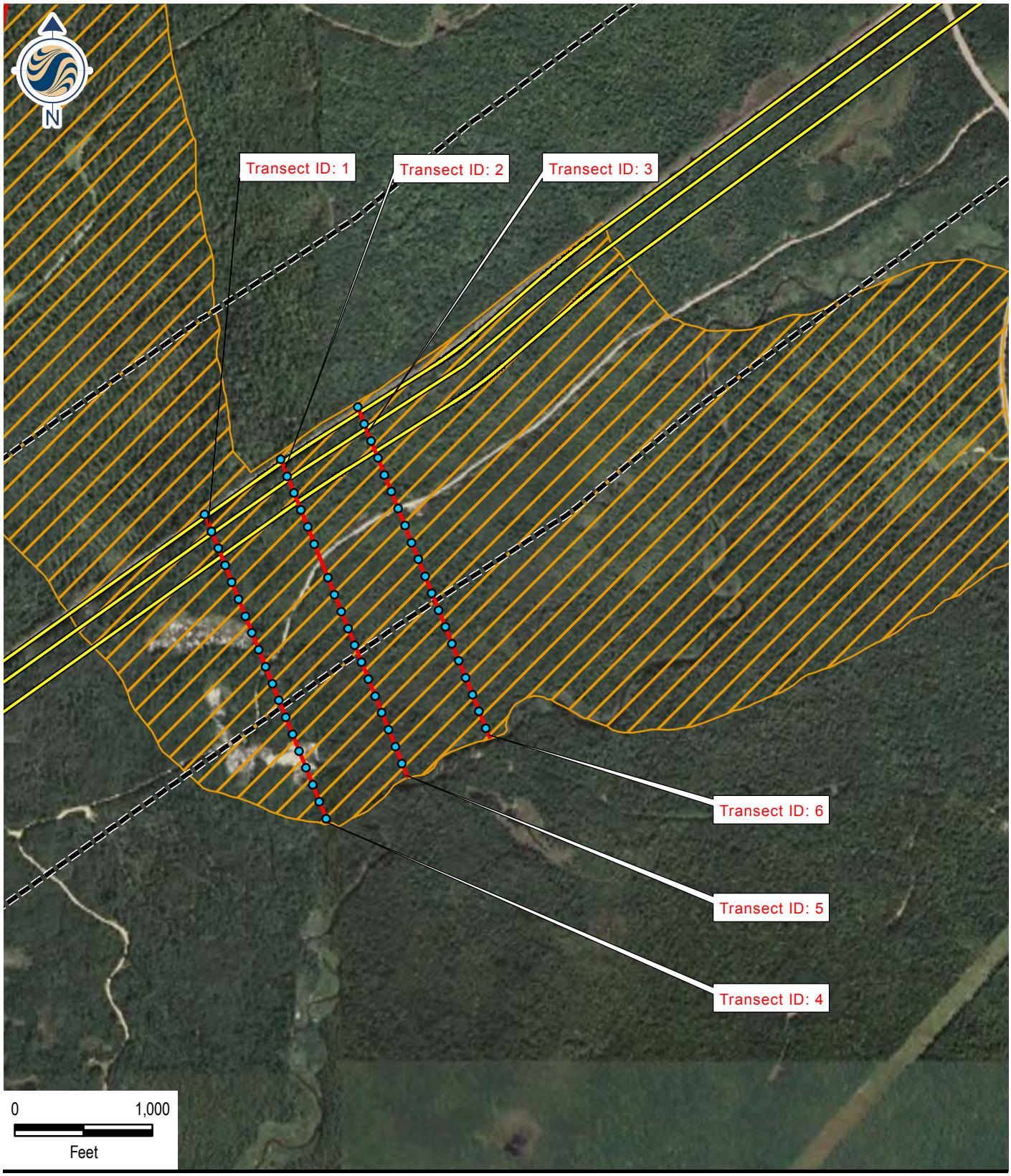
Legend

- 2009 DWA Survey Point
- 2009 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
9

Title
Woodville Deer Wintering Area #100198
April 28, 2010



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00518-F0010-2010-DWA-Map.mxd

Legend

- 2009 DWA Survey Point
- 2009 DWA Transect
- Proposed Transmission Line (4-14-10)
- 1/4 Mile Limit
- Deer Wintering Area
- Town Boundary

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
10

Title
Chester Deer Wintering Area #100112

April 28, 2010

Appendix A

Study Plan

March 1, 2010

Allen Star
Maine Department of Inland Fisheries and Wildlife
73 Cobb Road
Enfield, Maine 04493

Subject: Proposed Deer Wintering Area Study Plan
Proposed Oakfield II Transmission Line, Penobscot and Aroostook Counties, Maine

Dear Allen:

Thank you for the opportunity to meet on February 4, 2010, to discuss the proposed Oakfield II transmission line and the potential impacts relative to Deer Wintering Areas (DWAs). This letter outlines the proposed study plan that Stantec Consulting (Stantec) will implement to survey and characterize the DWAs that are located within the proposed transmission line project area. We are providing this study plan to the Maine Department of Inland Fisheries and Wildlife (MDIFW) Region F biologists for review and comment prior to the initiation of field surveys in 2010.

Project Overview
Maine GenLead, LLC (Maine GenLead) proposes to construct an approximately 60-mile transmission line extending from a summit generation area in Oakfield, Maine to a substation in Chester (Figure 1). The transmission line will extend southerly along the eastern boundary of T4 R3 WELS, T3 R3 WELS, and Glenwood Plantation. In Glenwood Plantation, the proposed transmission line will continue southwesterly and largely parallel to the existing Maine Power Connection (MPC) 345-kilovolt transmission line, as well as portions of the Stetson Mountain Line 56 transmission line, to a substation in Chester. Along its route, the proposed transmission line will intersect portions of nine DWAs. These include DWAs as mapped by the MDIFW under the Natural Resources Protection Act, areas zoned as P-FW Subdistricts by the Maine Land Use Regulation Commission (LURC), and areas identified as part of a management agreement between Fraser Papers (Fraser) and the MDIFW. These include the following areas:

- T3 R3 WELS, LURC P-FW #100071 (Figure 2);
- T3 R3 WELS, LURC P-FW #100068 (Figure 3);
- Glenwood Plantation, Fraser DWA #992801 (Figure 4);
- Reed Plantation, Fraser DWA #992202 (Figure 5);
- Reed Plantation, Fraser DWA #992301 (Figure 6);
- Macwahoc Plantation, Fraser DWA # 991502 (Figure 7);
- Mattawamkeag, MDIFW DWA # 100195 (Figure 8);
- Woodville, MDIFW DWA #100198 (Figure 9); and
- Chester, MDIFW DWA #100112 (Figure 10).

In many instances, the proposed transmission line has been located to minimize fragmentation within the DWA. This has been accomplished by co-locating many portions of the transmission line along existing transmission line corridor right-of-ways or locating the proposed transmission line along the edges of the DWA. The proposed transmission line will intersect interior portions of two DWAs – Reed Plantation DWA #992202 and Macwahoc Plantation DWA #991502.

DWA Survey Methodology

In March 2009, Stantec conducted DWA evaluations within portions of the DWAs in Chester, Woodville, Mattawamkeag, Macwahoc Plantation, and Reed Plantation. Through consultation with MDIFW Region F biologists, this survey effort included establishing transects within a 0.25-mile area associated with the proposed transmission line. A 0.25-mile zone was chosen as the proposed transmission line was co-located with existing transmission lines (i.e., existing permanent habitat fragmentation features). Transects were largely established along the proposed centerline of the transmission line, as well as within a 0.25-mile zone on either side of the proposed corridor. Transects within the 0.25-mile zone were oriented to provide sufficient coverage in order to accurately characterize the existing canopy cover and deer use within that zone. Transects were conducted during appropriate deer wintering conditions as outlined in the DWA and Travel Corridor MDIFW guidance document (December 22, 1993). Along each transect, data were collected on forest stand type, white-tailed deer (deer; *Odocoileus virginianus*) use, and general landscape characteristics along 2-chain (i.e., 132 feet) intervals using the standard MDIFW DWA data collection form. The attached figures show the locations of the transects surveyed within each DWA in 2009.

Subsequent to the 2009 DWA surveys, changes were made to the transmission line alignment. These changes resulted in additional intersections with DWAs in T3 R3 WELS, Glenwood Plantation, Reed Plantation, and Macwahoc Plantation that were not surveyed and characterized during the 2009 field surveys. The following summarizes the proposed survey approach that Stantec will implement within each of the additionally intersected DWAs. The portions of the DWAs surveyed in 2009 will not be revisited in 2010. These include Reed Plantation DWA #992301 (Figure 6), Mattawamkeag DWA #100195 (Figure 8), Woodville DWA #100198 (Figure 9), and Chester DWA #100112 (Figure 10).

In summary, where the proposed transmission line intersects an edge of a DWA or where the proposed transmission line parallels an existing transmission line corridor (e.g., MPC or Line 56 corridors), surveys will be conducted within a 0.25-mile zone where landowner permission is granted to provide assessments of forest cover and habitat connectivity within the vicinity of the proposed transmission line. This approach is consistent with the 2009 survey effort that was implemented by Stantec. In areas where the proposed transmission line intersects interior portions of the DWA (e.g., away from an existing transmission line corridor or away from the edge of the DWA), a more robust survey effort will be conducted to characterize the existing forest cover and provide analyses of habitat connectivity within the DWA. Within the survey areas, transects will be oriented to provide sufficient coverage to characterize forest cover types following the guidelines in the DWA and Travel Corridor MDIFW guidance document (December 22, 1993). This includes orienting a transect along the centerline of the proposed transmission line corridor. Data will be collected along 2-chain intervals of forest stand type, evidence of wintering deer use, and general landscape characteristics. Stantec will prepare a detailed report of the field methodologies and the results of the surveys. These results and the completed DWA data forms and representative site photographs will be provided for the MDIFW.

T3 R3 WELS, LURC P-FW #100071

The proposed transmission line will intersect the eastern edge of the LURC P-FW DWA # 100071 in T3 R3 WELS (Figure 2). Stantec will establish and conduct field surveys along 2 transects within a 0.25-mile zone to the west of the proposed transmission line, as well as along the centerline of the proposed transmission line, to characterize forest cover and deer use within the vicinity of the proposed transmission line.

T3 R3 WELS, LURC P-FW #100068

The proposed transmission line will intersect a narrow portion of the LURC P-FW DWA #100068 along the eastern edge of the DWA in the vicinity of the West Branch of the Mattawamkeag River in T3 R3 WELS (Figure 3). Stantec will establish and conduct field surveys along 1 transect within a 0.25-mile zone to the west of the proposed transmission line, as well as along the centerline of the proposed transmission line. Although this LURC DWA is contiguous to a MDIFW DWA (#100068) in Haynesville, Maine GenLead and Stantec do not have landowner permission to conduct field surveys in Haynesville. As such, an

interpretation of forest cover within a 0.25-mile zone to the east of the proposed transmission line will be completed using aerial photography analysis.

Glenwood Plantation, Fraser DWA #992801
The proposed transmission line is located adjacent to the western edge of the Fraser DWA #992801 along the Haynesville town line in Glenwood Plantation (Figure 4). Although the boundary of this DWA likely follows the Haynesville town line, the spatial Geographic Information Systems (GIS) data obtained by Stantec indicate that this DWA extends slightly into Glenwood Plantation and abuts the proposed transmission line. As such, Stantec will establish one transect along the centerline of the proposed transmission line where it parallels and abuts the Fraser DWA. Additional surveys will not be conducted within the DWA in Haynesville as landowner permission has not been granted to Stantec.

Reed Plantation, Fraser DWA #992202
Portions of Fraser DWA #992202 in Reed Plantation were surveyed in 2009 by Stantec. However, the alignment of the proposed transmission line through this DWA has changed since the 2009 field surveys were conducted (Figure 5), resulting in an intersection of interior portions of the DWA. In order to provide assessments of habitat connectivity and travel corridors within the vicinity of the proposed transmission line, Stantec will conduct surveys along seven transects, including the centerline of the proposed transmission line in an area extending east from an unnamed gravel road that bisects the DWA to the existing MPC open transmission line corridor along the eastern edge of the DWA.

Macwahoc Plantation, Fraser DWA # 991502
Stantec surveyed portions of this DWA in 2009. However, the alignment of the proposed transmission line through this DWA has changed since the 2009 field surveys were conducted (Figure 7), resulting in an intersection of interior portions of the DWA. In order to provide assessments of habitat connectivity and travel corridors within the vicinity of the proposed transmission line, Stantec will conduct surveys along six transects, including the centerline of the proposed transmission line in the DWA north of the existing MPC transmission line corridor to the North Yarmouth Academy Grant Township line and west of Molunkus Stream.

2009 DWA Survey Areas
The proposed transmission line through the DWAs in Reed Plantation (Figure 6), Mattawamkeag (Figure 8), Woodville (Figure 9), and Chester (Figure 10), which were surveyed in 2009, is co-located with the existing MPC or Line 56 open transmission corridors. As the alignment of the transmission line through these areas has not changed since the 2009 field surveys were conducted, these areas will not be revisited in 2010.

Stantec anticipates conducting field surveys in March 2010 during appropriate snow and temperature conditions. We respectfully request that any comments that MDIFW may have regarding this DWA study plan be submitted to us by March 5, 2010.

Sincerely,
STANTEC CONSULTING

Matt Arsenault

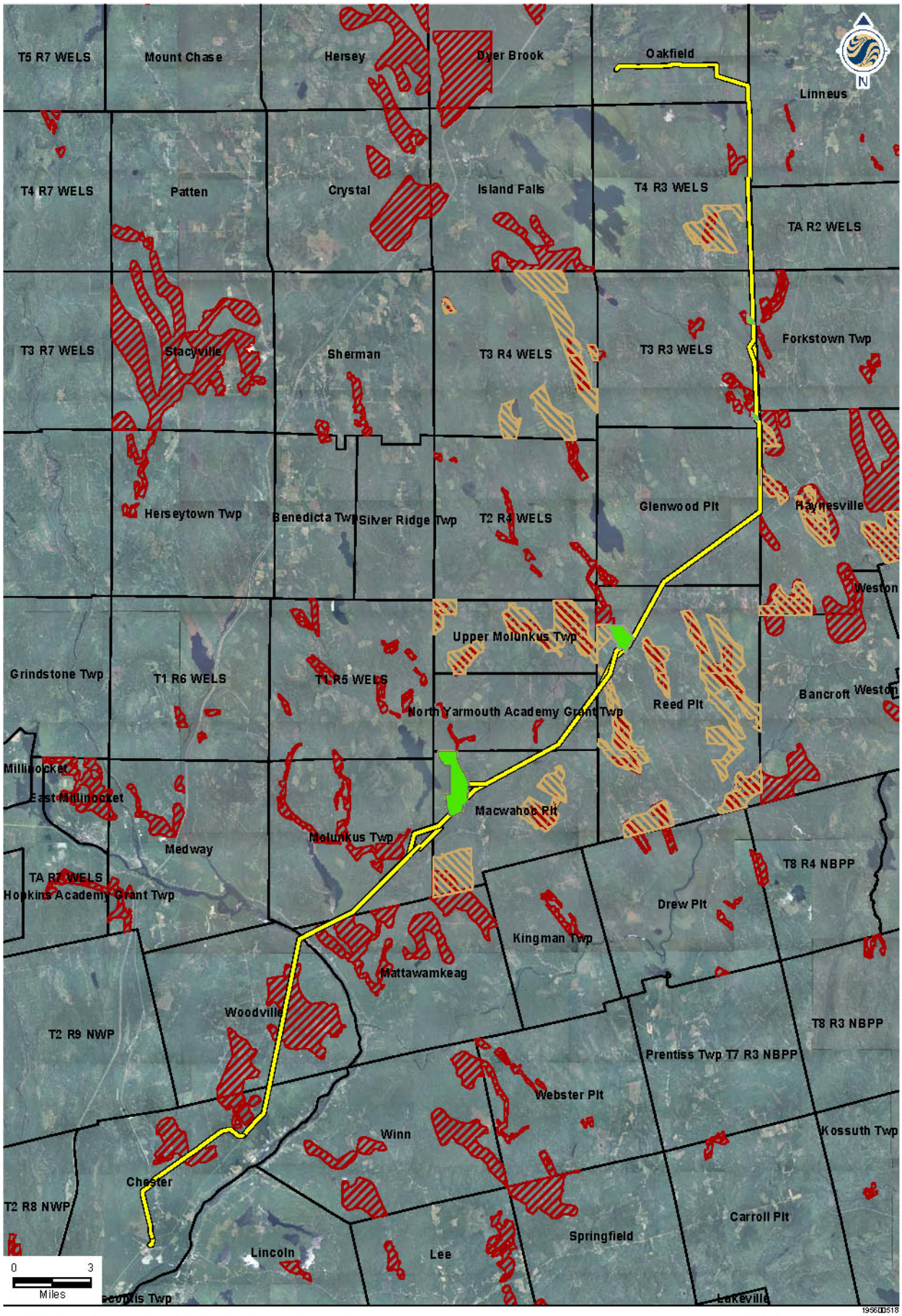
Matt Arsenault
Certified Ecologist

Dale Knapp

Dale Knapp
Director, Water Resources Division

CC: Brook Barnes, Project Manager, Stantec
PN 195600518

Stantec



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00518-F001-2010-DOA-Map.mxd

Legend

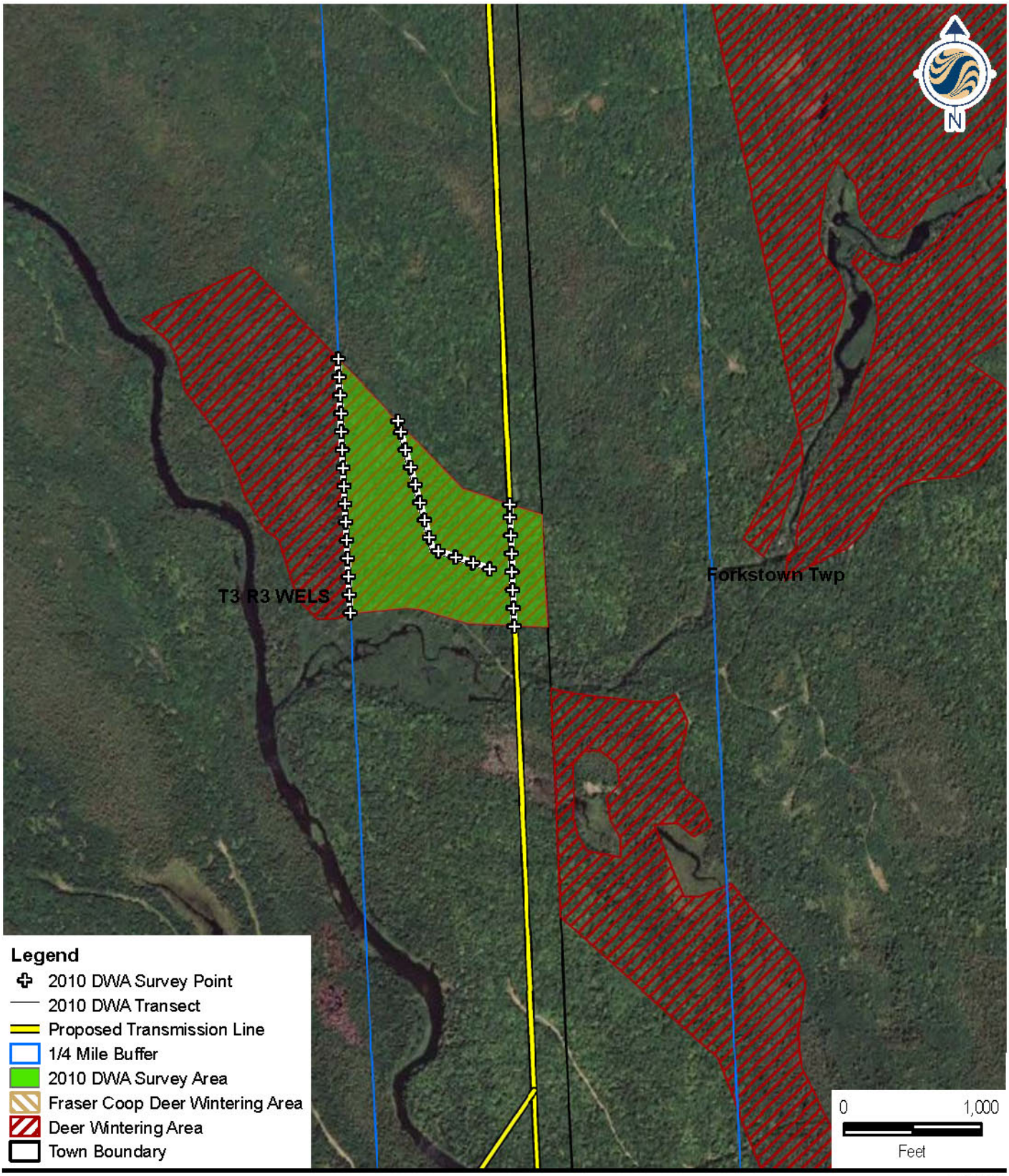
- Proposed Transmission Line (1-29-2010)
- 2010 DWA Survey Area
- Fraser Coop Deer Wintering Areas
- Deer Wintering Area
- Town Boundaries

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
1

Title
Proposed 2010 Deer Wintering Area Survey Area

February 17, 2010



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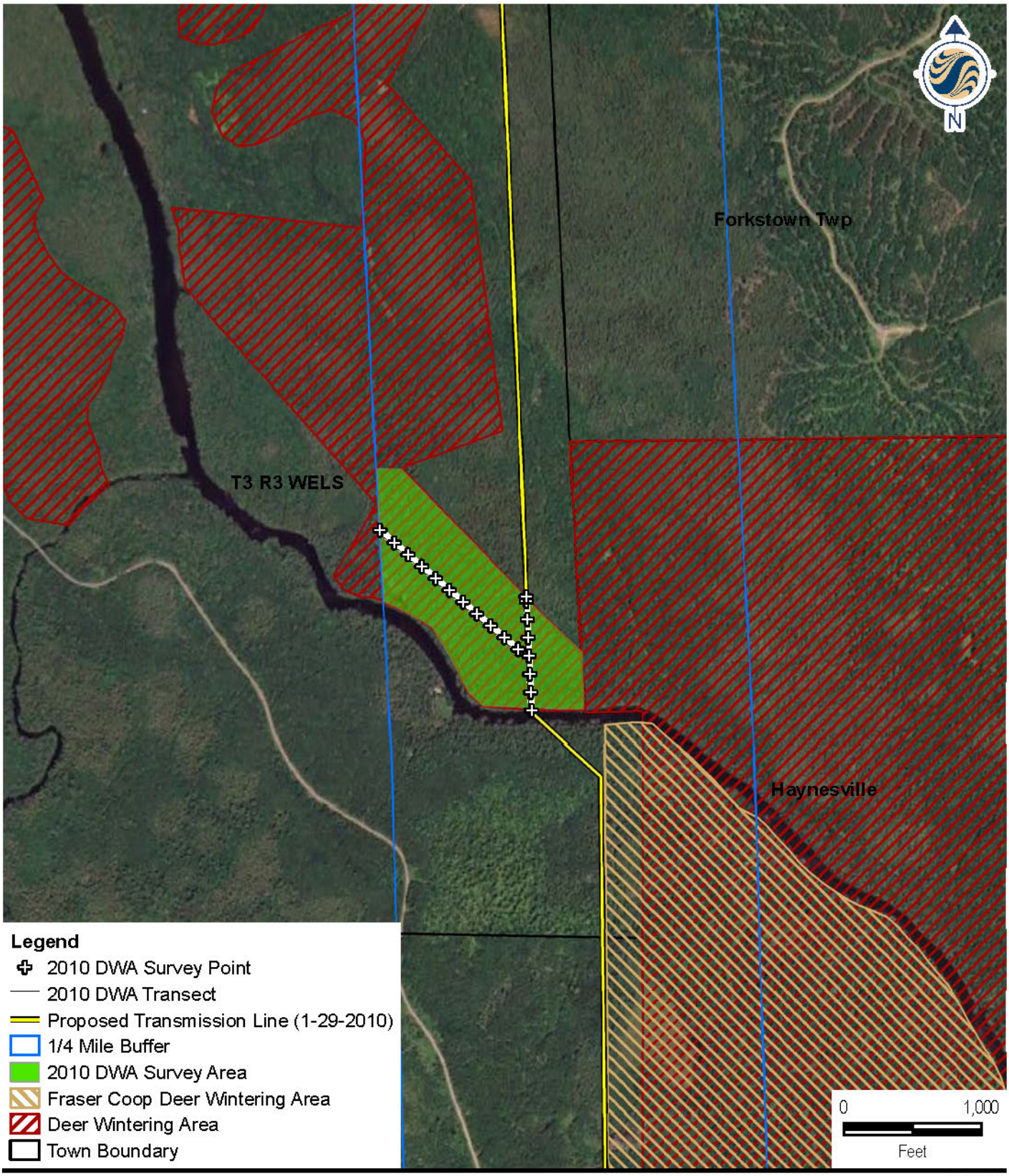
00518-F002-2010-DWA-Map.mxd

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
2

Title
Proposed 2010 Deer Wintering Area Survey Area #100071

February 17, 2010



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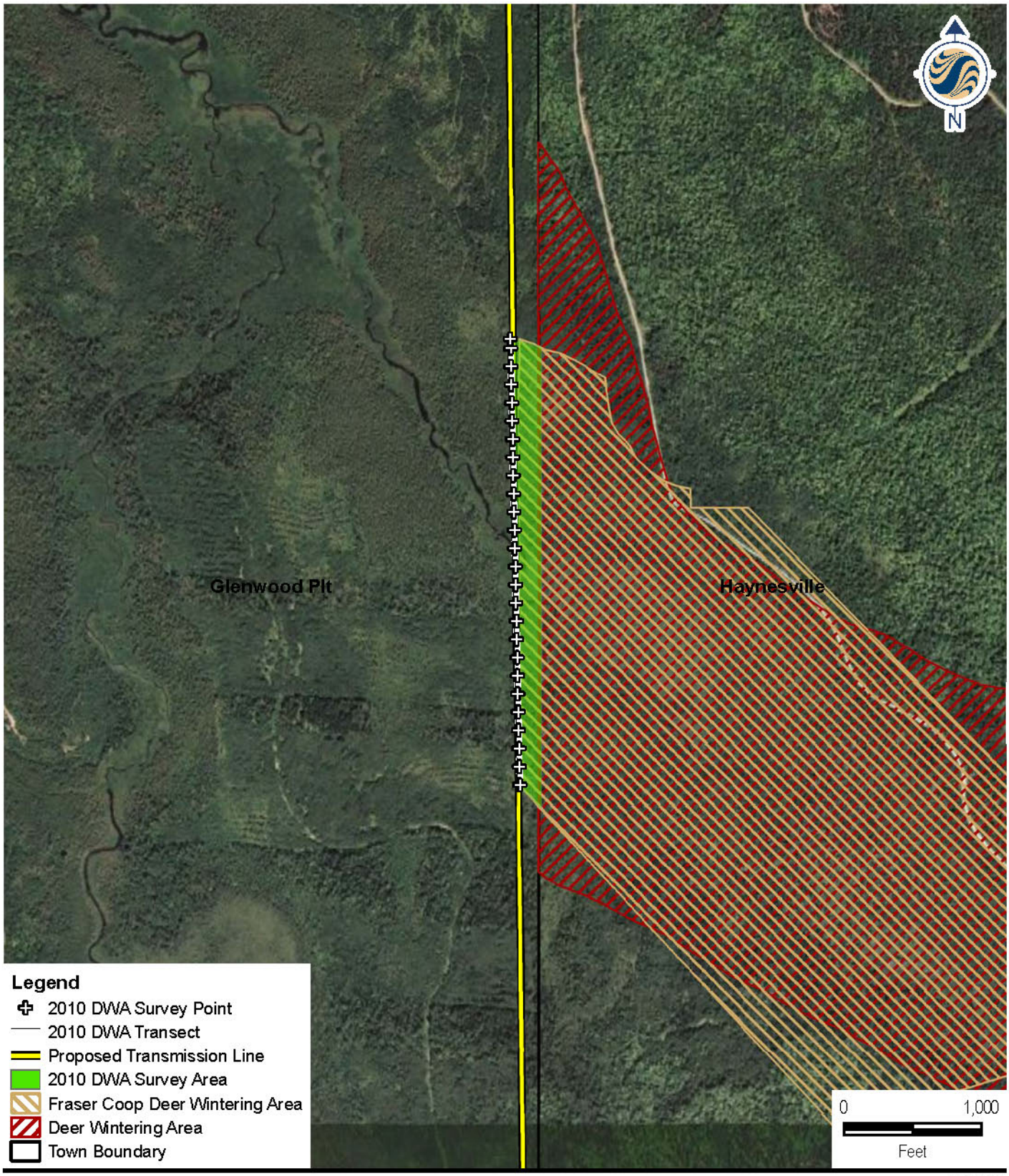
Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
3

Title
Proposed 2010 Deer Wintering Area Survey Area #100068

February 17, 2010



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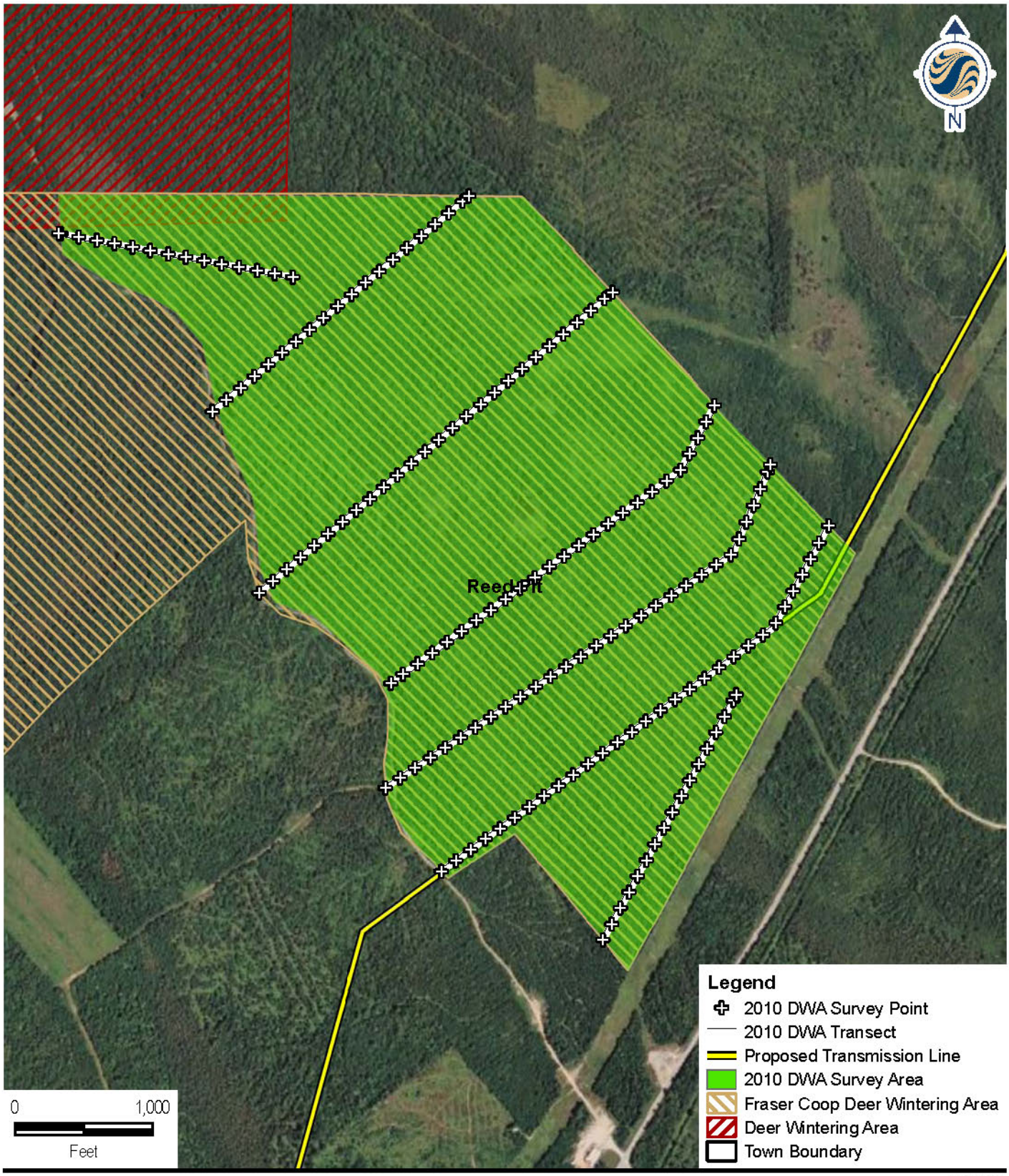
Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
4

Title
Proposed 2010 Deer Wintering Area Survey Area #992801

February 17, 2010



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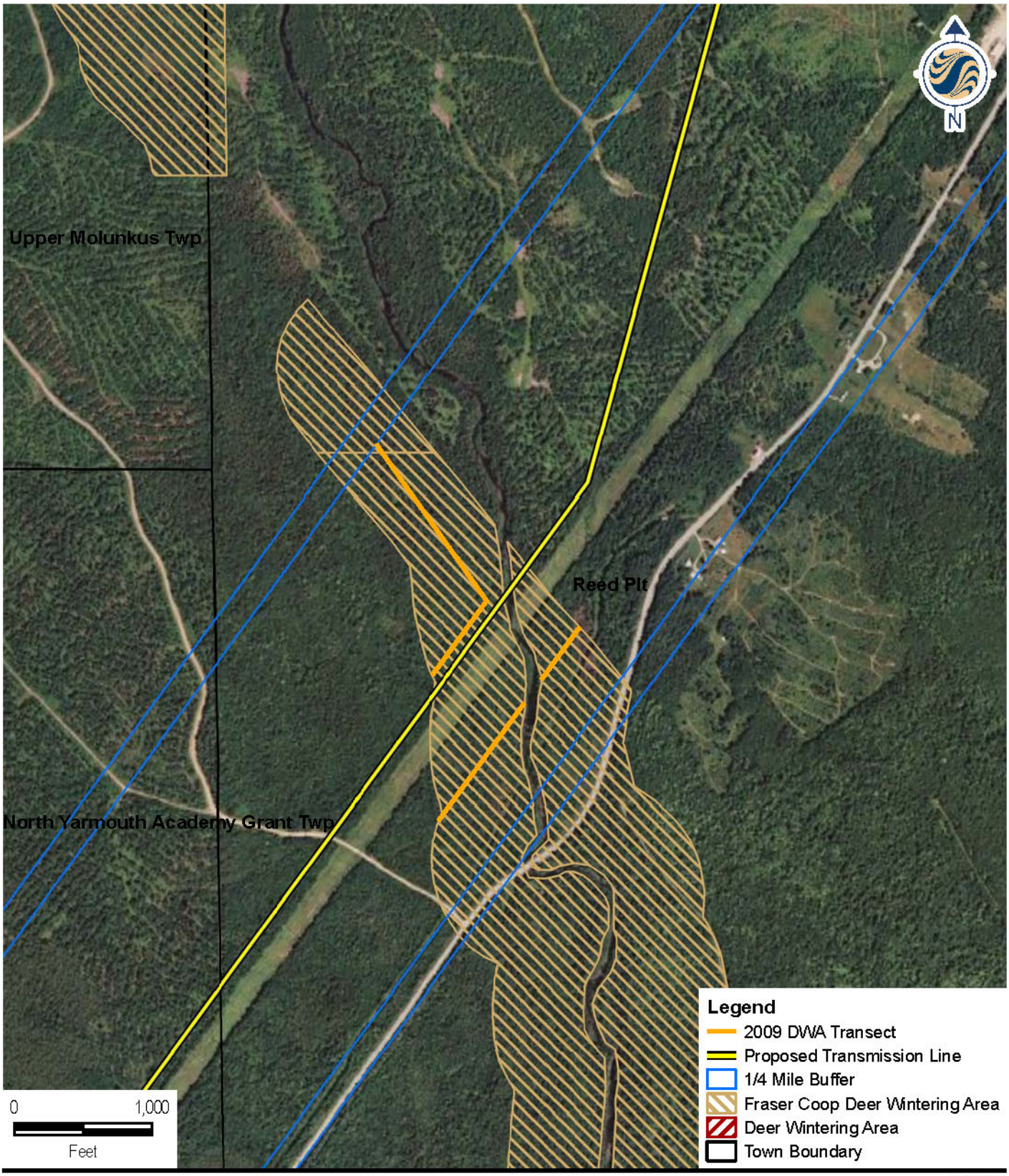
00518-F005-2010-DWA-Map.mxd

Client/Project
Oakfield Wind Project
Oakfield, Maine

Figure No.
5

Title
Proposed 2010 Deer Wintering Area Survey Area #992202

February 17, 2010



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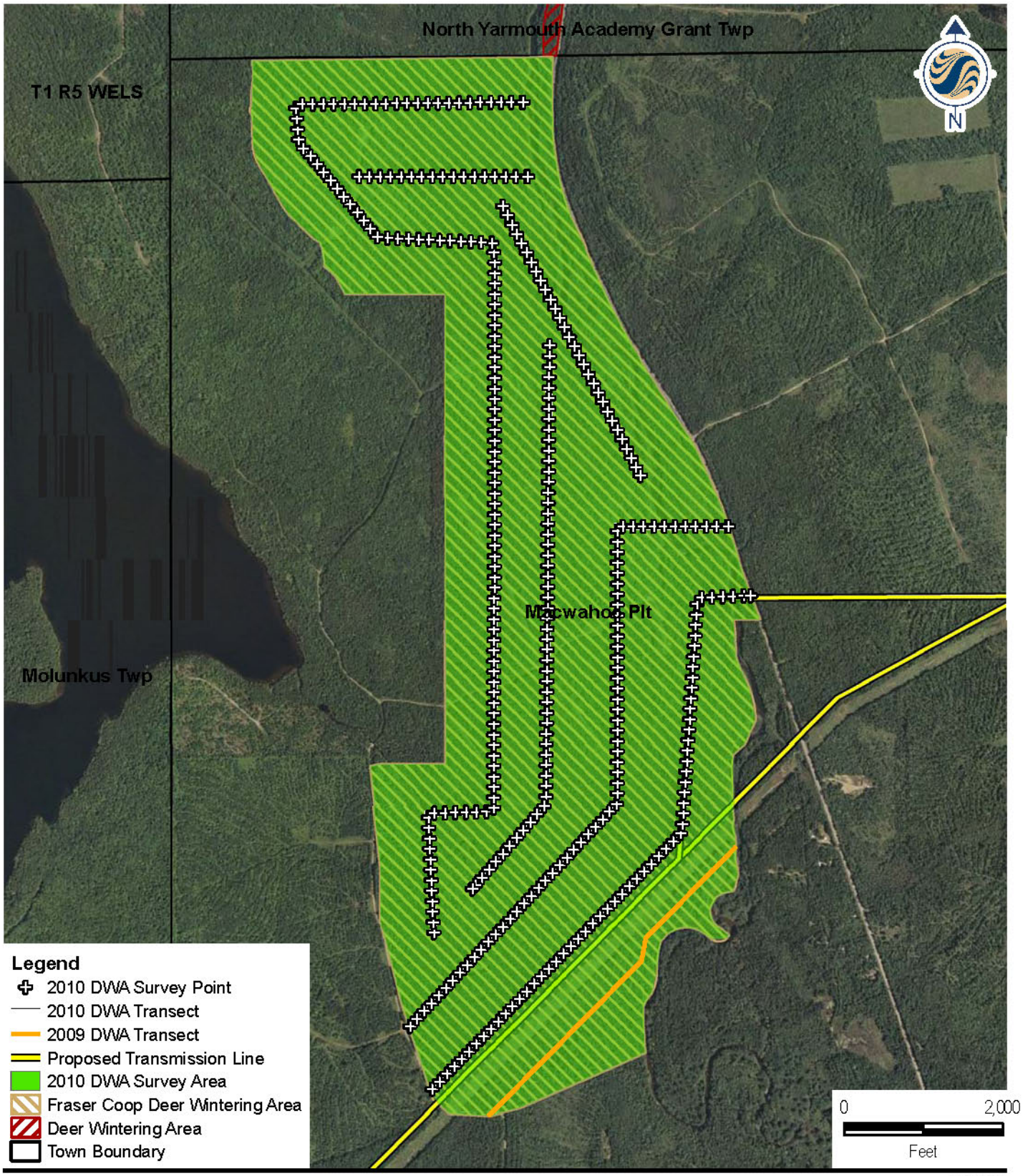
00518-F006-2010-DWA-Map.mxd

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
6

Title
Proposed 2010 Deer Wintering Area Survey Area #992301

February 17, 2010



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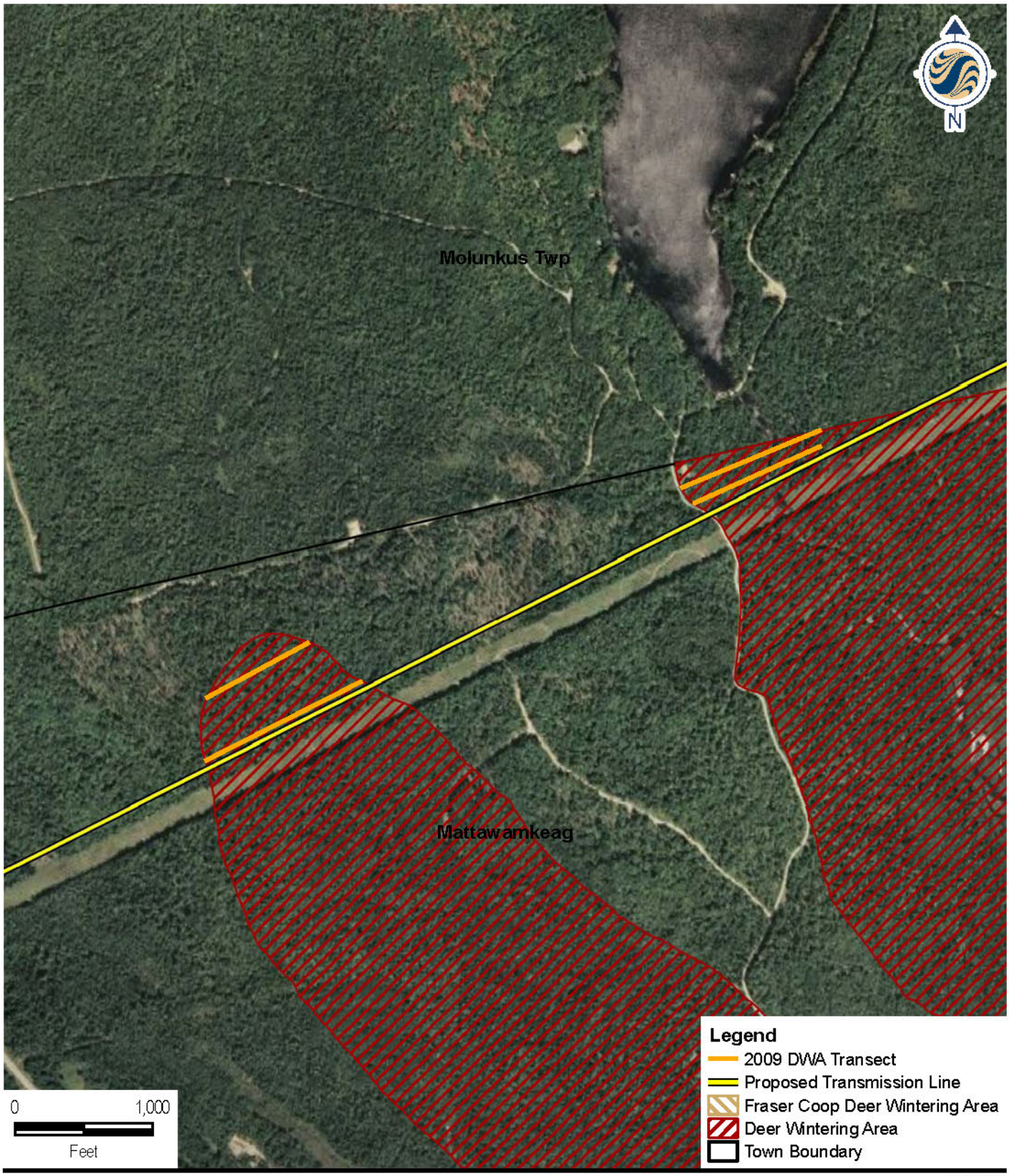
00518-F007-2010-DWA-Map.mxd

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
7

Title
Proposed 2010 Deer Wintering Area Survey Area #991502

February 17, 2010



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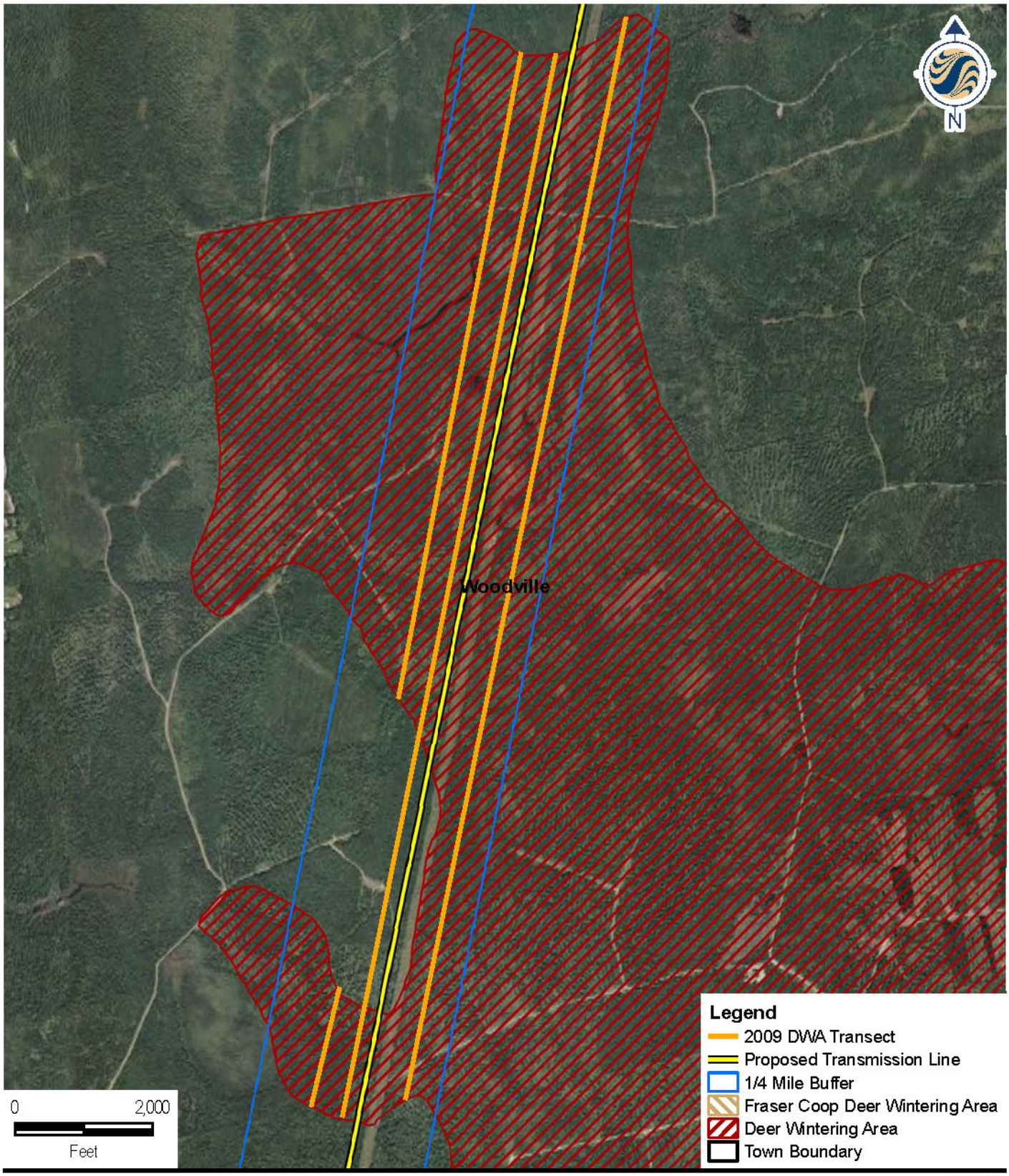
Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
8

Title
Proposed 2010 Deer Wintering Area Survey Area #100195

February 17, 2010



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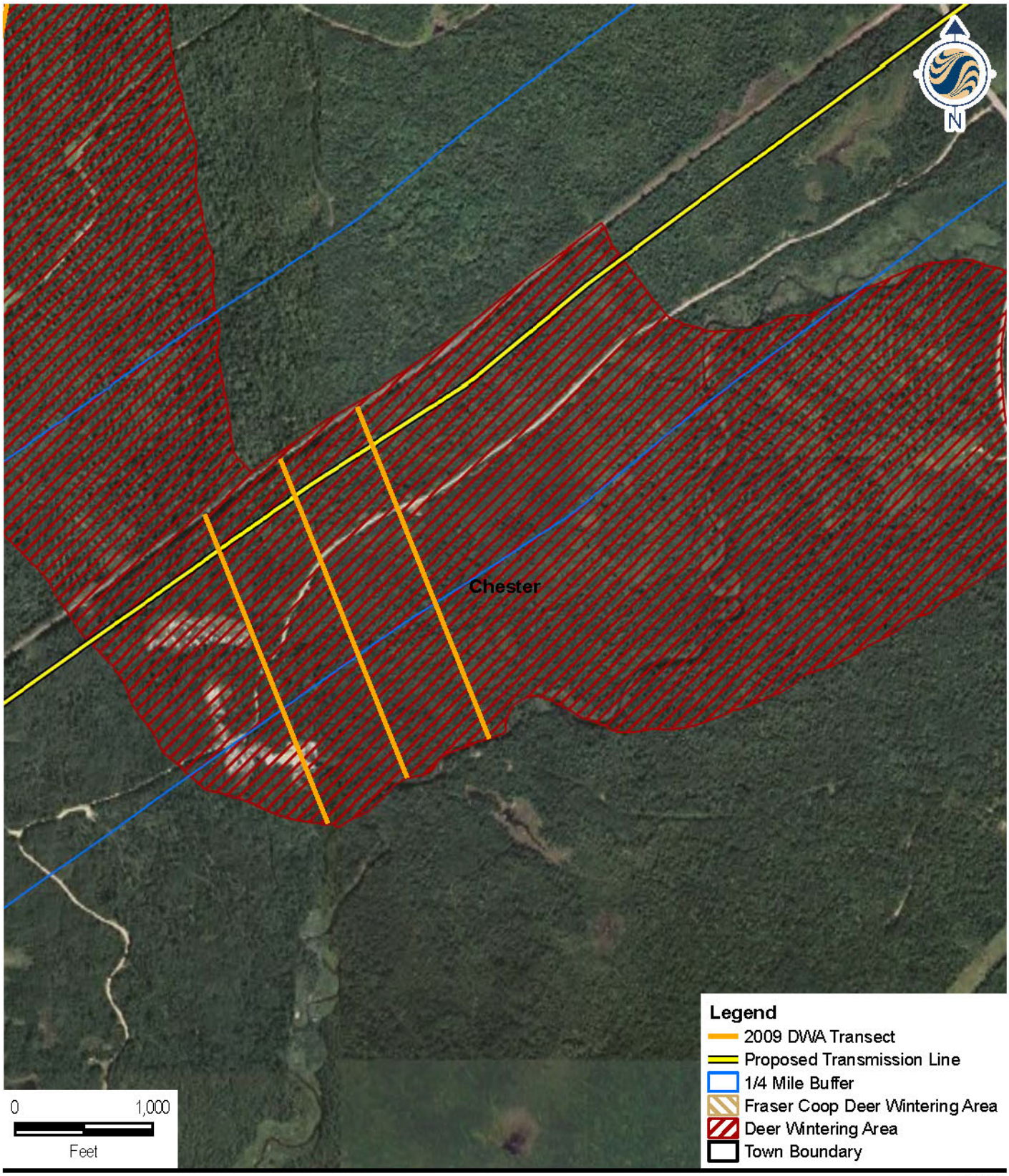
00518-F009-2010-DWA-Map.mxd

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
9

Title
Proposed 2010 Deer Wintering Area Survey Area #100198

February 17, 2010



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00518-F0010-2010-DWA-Map.mxd

Client/Project
Oakfield II Wind Project
Oakfield, Maine

Figure No.
10

Title
Proposed 2010 Deer Wintering Area Survey Area #100112

February 17, 2010

Appendix B

Representative Site Photographs

Photo 1. T3R3 WELS North DWA, Transect 1, Plot 1, Early Successional Forest. Stantec Consulting, March 10,2010.

Photo 2. T3R3 WELS North DWA, Transect 1, Plot 5, Mixed Forest. Stantec Consulting, March 10,2010.

Photo 3. T3R3 WELS North DWA, Transect 2, Plot 1, Mixed Forest.
Stantec Consulting, March 10,2010.

Photo 4. T3R3 WELS North DWA, Transect 2, Plot 4, Hemlock-Fir Forest.
Stantec Consulting, March 10,2010.

Photo 5. T3R3 WELS South DWA, Transect 1, Plot 1, Hemlock Forest.
Stantec Consulting, March 10,2010.

Photo 6. T3R3 WELS South DWA, Transect 1, Plot 5, Spruce-Fir-Cedar Forest.
Stantec Consulting, March 10,2010.

Photo 7. T3R3 WELS South DWA, Transect 1, Plot 7, Spruce-Fir-Cedar Forest. Stantec Consulting, March 10,2010.

Photo 8. Glenwood Plantation DWA, Transect 1, Plot 7, Second-Growth Spruce-Fir Forest, Stantec Consulting, March 8, 2010

Photo 9. Glenwood Plantation DWA, Transect 1, Plot 10, Scrub-Shrub Wetland.
Stantec Consulting, March 8, 2010.

Photo 10. Glenwood Plantation DWA, Transect 1, Plot 17, Cedar Swamp.
Stantec Consulting, March 8, 2010.

Photo 11. Reed Plantation North DWA, 2009 Transect 1, Plot 16, Regenerating Fir Forest. Stantec Consulting, March 23, 2009.

Photo 12. Reed Plantation North DWA, 2009 Transect 1, Plot 18, Regenerating Fir Forest. Stantec Consulting, March 23, 2009.

Photo 13. Reed Plantation North DWA, 2009 Transect 1, Plot 4, Second-Growth Mixed Forest. Stantec Consulting, March 23, 2009.

Photo 14. Reed Plantation North DWA, 2010 Transect 1, Plot 13, Cedar Swamp. Stantec Consulting, March 8, 2010.

Photo 15. Reed Plantation North DWA, 2010 Transect 1, Plot 20, Early Successional Forest. Stantec Consulting, March 8, 2010.

Photo 16. Reed Plantation North DWA, 2010 Transect 3, Plot 3, Second-Growth Softwood Forest. Stantec Consulting, March 8, 2010

Photo 17. Reed Plantation North DWA, 2010 Transect 3, Plot 27, Regenerating Fir Forest. Stantec Consulting, March 8, 2010.

Photo 18. Reed Plantation North DWA, 2010 Transect 4, Plot 11, Early Successional Forest. Stantec Consulting, March 8, 2010.

Photo 19. Reed Plantation North DWA, 2010 Transect 4, Plot 16, Cedar Swamp.
Stantec Consulting, March 8, 2010

Photo 20. Reed Plantation South DWA, 2009 Transect 4, Plot 1, Early Successional Forest.
Stantec Consulting, March 23, 2009.

Photo 21. Reed Plantation South DWA, 2009 Transect 4, Plot 5, Early Successional Forest. Stantec Consulting, March 23, 2009.

Photo 22. Reed Plantation South DWA, 2009 Transect 4, Plot 8, Early Successional Forest. Stantec Consulting, March 23, 2009.

Photo 23. Reed Plantation South DWA, 2009 Transect 4, Plot 16, Spruce-Fir Forest. Stantec Consulting, March 23, 2009.

Photo 24. Macwahoc Plantation DWA, 2009 Transect 2, Plot 15, Hemlock-Cedar Forest. Stantec Consulting, March 24, 2009.

Photo 25. Macwahoc Plantation DWA, 2009 Transect 2, Plot 27, Early Successional Forest, Stantec Consulting, March 24, 2009.

Photo 26. Macwahoc Plantation DWA, 2009 Transect 3, Plot 22, Cedar Swamp. Stantec Consulting, March 24, 2009.

Photo 27. Macwahoc Plantation DWA, 2009 Transect 3, Plot 42, Cedar Swamp.
Stantec Consulting, March 24, 2009.

Photo 28. Macwahoc Plantation DWA, 2010 Transect 1, Plot 12, Second-Growth Mixed Forest.
Stantec Consulting, March 9, 2010.

Photo 29. Macwahoc Plantation DWA, 2010 Transect 1, Plot 18, Second-Growth Mixed Forest. Stantec Consulting, March 9, 2010.

Photo 30. Macwahoc Plantation DWA, 2010 Transect 2, Plot 32, Hemlock Forest. Stantec Consulting, March 9, 2010

Photo 31. Macwahoc Plantation DWA, 2010 Transect 3, Plot 24, Second-Growth Softwood Forest. Stantec Consulting, March 9, 2010.

Photo 32. Mattawamkeag DWA, 2009 Transect 1, Plot 5, Second-Growth Mixed Forest. Stantec Consulting, March 23, 2009.

Photo 33. Mattawamkeag DWA, Deer Trail along Transect 2, Plot 4.
Stantec Consulting, March 23, 2009.

Photo 34. Mattawamkeag DWA, 2009 Transect 3, Plot 4, Early Successional Mixed Forest.
Stantec Consulting, March 23, 2009.

Photo 35. Woodville DWA, 2009 Transect 5, Plot 5, Regenerating Softwood Forest. Stantec Consulting, March 20, 2009.

Photo 36. Woodville DWA, 2009 Transect 5, Plot 11, Regenerating Clear-Cut. Stantec Consulting, March 20, 2009.

Photo 37. Woodville DWA, 2009 Transect 5, Plot 21, Black Spruce Bog.
Stantec Consulting, March 20, 2009.

Photo 38. Woodville DWA, 2009 Transect 5, Plot 29, Second-Growth Cedar Swamp.
Stantec Consulting, March 20, 2009.

Photo 39. Woodville DWA, 2009 Transect 5, Plot 37, Selectively Harvested Cedar Swamp. Stantec Consulting, March 20, 2009.

Photo 40. Woodville DWA, 2009 Transect 5, Plot 50, Early Successional Forest. Stantec Consulting, March 20, 2009.

Photo 41. Woodville DWA, 2009 Transect 2, Regeneration Spruce-Fir.
Stantec Consulting, March 20, 2009.

Photo 42. Chester DWA, 2009 Transect 1, Plot 28, Early Successional Forest.
Stantec Consulting March 27, 2009.

Photo 43. Chester DWA, 2009 Transect 2, Plot 3, Early Successional Forest. Stantec Consulting March 27, 2009.

Photo 44. Chester DWA, 2009 Transect 2, Plot 5, Early Successional Forest. Stantec Consulting March 27, 2009.

Photo 45. Chester DWA, 2009 Transect 5, Plot 8, Second-Growth Softwood Forest. Stantec Consulting March 30, 2009.

Photo 46. Chester DWA, 2009 Transect 5, Plot 9, Second-Growth Softwood Forest. Stantec Consulting March 30, 2009.

Appendix C

Completed DWA Data Forms

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100112 **Town(s)** Chester **Date:** 3/27/09

Snow Depth: Open 18-30" Cover 18-30"

Crew: S. Duigan, C. Ferris **Sinking:** Open 4-6" with Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >14 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1, South to North

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	28	S to N	n/a	none	road edge
Y	27	S to N	SH1B	none	Pic rub, Bet pop, Abi bal, Pin str
Y	26	S to N	SH1B	none	Ace sac, Tsu can, Bet all, Ace rub
Y	25	S to N	S1B	none	Ace sac, Tsu can, Bet all, Ace rub
Y	24	S to N	HS2B	none	Pop gra, Abi bal, Pic rub
Y	23	S to N	SH2B	none	Pop gra, Thu occ, Bet all, alnus, Abi bal
Y	22	S to N	S2B/S3B	none	Thu occ, Bet all, Abi bal
Y	21	S to N	S2B/S3B	none	Thu occ, Bet all, Abi bal
Y	20	S to N	n/a	none	Line 56
Y	19	S to N	SH2B	none	20' strip between Line 56 and railroad

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100112 **Town(s)** Chester **Date:** 3/27/09

Snow Depth: Open 18-30" Cover 18-30"

Crew: S. Duigan, C. Ferris **Sinking:** Open 4-6" with Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >14 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 2, North to South

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	0	N to S	SH1A	none	20' strip between line 56 and rail road
Y	1	N to S	n/a	none	line 56
Y	2	N to S	SH2B	none	Ace sac, Tsu can, Bet all, Ace rub
Y	3	N to S	HS2C	none	Thu occ, Ace rub, Abi bal, Pin str, Bet pop
Y	4	N to S	SH2B	none	S1A understory
Y	5	N to S	HS1A	none	spruce-fir, Bet pop regen
					snow depth varied with sun exposure

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100112 **Town(s)** Chester **Date:** 3/27/09

Snow Depth: Open 18-30" Cover 18-30"

Crew: S. Duigan, C. Ferris **Sinking:** Open 4-6" with Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 1

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >14 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 3, Chain 44, South to North

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	44	160 deg T	n/a	none	at road/line 56 yard
Y	43	160 deg T	n/a	none	at road/line 56 yard
Y	42	160 deg T	SH2B	Tr	1 set tracks at edge of log yard
Y	41	160 deg T	S2B	none	moose track and moose bed
Y	40	160 deg T	SH2B	none	S1B understory, Abi bal, Tsu can
Y	39	160 deg T	n/a	none	Line 56
Y	38	160 deg T	SH1B	none	20' strip between Line 56 and railroad

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100112 **Town(s)** Chester **Date:** 3/27/09

Snow Depth: Open 18-30" Cover 18-30"

Crew: S. Duigan, C. Ferris **Sinking:** Open 4-6" with Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >14 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 4, North to South

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	29	160 deg T	HS1B	none	road edge, Bet pop, Thu occ, Abi bal
Y	30	160 deg T	HS1B	none	Ace rub, Bet pop, Abi bal
Y	31	160 deg T	SH2B	none	Abi bal, Pop gra, Bet pop
Y	32	160 deg T	PEM	none	Former PFO beaver flowage
Y	33	160 deg T	PEM	none	Former PFO beaver flowage
Y	34	160 deg T	PEM	none	Former PFO beaver flowage
Y	35	160 deg T	S1B	none	edge of wetland
Y	36	160 deg T	S1B	none	
Y	37	160 deg T	S1B	none	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100112 **Town(s):** Chester **Date:** 3/27/09

Crew: C. Ferris, S. Duigan

Snow Deptl Open 25-30" Cover 25-30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare _____ Common X Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect # 5 is south of the road used to access the area in the center.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
	1	160 deg T	S 3 B	None	next to stream
	2	160 deg T	SH 3 C	None	
	3	160 deg T	HS 3 C	None	
	4	160 deg T	HS 3 C	None	
	5	160 deg T	SH 3 C	None	
	6	160 deg T	SH 3 C	None	
	7	160 deg T	SH 3 B	None	
	8	160 deg T	SH 2 C	None	
	9	160 deg T	SH 3 C	None	
	10	160 deg T	SH 2 C	None	
	11	160 deg T	HS 2 C	None	
	12	160 deg T	H 1 C	None	next to road

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100112 **Town(s):** Chester **Date:** 3/27/09

Crew: C. Ferris, S. Duigan

Snow Deptl Open 25-30" Cover 25-30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare _____ Common X Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect # 6 is south of the road used to access the area on the east end.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
	1	160 deg T	HS 2 C	None	next to road
	2	160 deg T	SH 2 C	None	
	3	160 deg T	SH 3 C	None	
	4	160 deg T	HS 2 C	None	
	5	160 deg T	HS 3 C	None	
	6	160 deg T	SH 3 C	None	
	7	160 deg T	S 3 C	None	
	8	160 deg T	S 2 B	None	
	9	160 deg T	S 3 C	None	
	10	160 deg T	S 3 C	None	
	11	160 deg T	SH 3 C	None	
	12	160 deg T	SH 3 C	None	
	13	160 deg T	S 3 B	None	next to stream

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992801 **Town(s)** Glenwood Plantation **Date:** March 8. 2010

Snow Depth: Open 14" Cover 8-14"

Crew: M. Arsenault, T. Tetreau **Sinking:** Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer <3

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1; TT = start at South end working North, MPA = Start at North end working south.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	0º True	S1C	None	
yes	2	0º True	S1C	None	
yes	3	0º True	S1B	None	
yes	4	0º True	SH2B	None	snowshoe hare pellets observed
yes	5	0º True	S2C	1P	old pellet group, no visible tracks nearby
yes	6	0º True	S2C	None	
yes	7	0º True	S1C	1P	old pellet group, no visible tracks nearby
yes	8	0º True	S1C	None	on edge of alder PSS swamp w/ stream through center
yes	9	0º True	S1C	None	PSS with residual black spruce and balsam fir
yes	10	0º True	S1C	None	PSS with residual black spruce
yes	11	0º True	S1C	None	Fringe of PSS
yes	12	0º True	Not forested	None	PSS along stream
yes	13	0º True	Not forested	None	PSS along stream
yes	14	0º True	Not forested	None	PSS along stream
yes	15	0º True	S2C	None	On edge of open wetland
yes	16	0º True	S2C	None	On edge of open wetland
yes	17	0º True	S2B	None	Denser cedar saplings
yes	18	0º True	S1C	None	Cedar saplings dominant
yes	19	0º True	S1C	None	Cedar saplings dominant
yes	20	0º True	S2C	None	Black spruce PFO
yes	21	0º True	S2C	None	Black spruce PFO
yes	22	0º True	S2C	None	Black spruce PFO
yes	23	0º True	S2C	None	Black spruce PFO
yes	24	0º True	S1C	None	Spruce-cedar woodland, historic browse on cedar
yes	25	0º True	S1C	None	Spruce-cedar woodland, historic browse on cedar

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: Frasier # 991502 **Town(s):** Macwahoc **Date**: 3/24/09

Crew: C. Ferris, M. Arsenault

Snow Deptl Open 30" Cover 30"
Sinking: Open 8" Cover 6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 6+

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect # 1 is on the south side of the T-line.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	50 deg T	SH 2 C	None	
Y	2	50 deg T	HS 1 C	None	
Y	3	50 deg T	HS 1 C	None	
Y	4	50 deg T	SH 3 C	None	
Y	5	50 deg T	SH 3 C	None	
Y	6	50 deg T	SH 3 C	None	
Y	7	50 deg T	SH 3 C	Tr, P	Pin str, Tsu can, Pic rub, Thu occ, Ace sac, Bet all
Y	8	50 deg T	S 3 C	None	
Y	9	50 deg T	S 3 C	None	
Y	10	50 deg T	S 3 C	None	
Y	11	50 deg T	SH 2 C	None	
Y	12	50 deg T	SH 2 C	None	
Y	13	50 deg T	SH 2 C	None	
Y	14	50 deg T	SH 1 C	None	
Y	15	50 deg T	S 3 C	None	
Y	16	50 deg T	SH 3 C	None	Pin str, Pic rub
Y	17	50 deg T	SH 3 C	None	
Y	18	50 deg T	SH 3 C	None	
Y	19	50 deg T	SH 3 C	None	
Y	20	50 deg T	SH 3 C	None	
Y	21	50 deg T	HS 2 C	None	
Y	22	50 deg T	HS 2 C	None	
Y	23	50 deg T	H 2 C	None	next to stream
Y	24	50 deg T	HS 2 C	Tr	floodplain
Y	25	50 deg T	HS 2 C	Tr	floodplain
Y	26	50 deg T	H 2 C	None	floodplain
Y	27	50 deg T	H 2 C	Tr	Old tracls, 10' sinking
Y	28	50 deg T	HS 2 C	None	floodplain
Y	29	50 deg T	HS 2 C	None	floodplain
Y	30	50 deg T	HS 2 C	None	floodplain
Y	31	50 deg T	HS 2 C	Tr	floodplain
Y	32	50 deg T	SH 2 C	Tr	multiple tracks within floodplain
Y	33	50 deg T	SH 2 C	Tr, P	floodplain
Y	34	50 deg T	SH 2 C	Tl	next to stream
Y	35	50 deg T	SH 2 C	Tl	next to stream

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 991502 **Town(s)** Macwahoc Plantation **Date:** March 9, 2010

Snow Depth: Open 12-18" Cover 6-18"

Crew: M. Arsenault **Sinking:** Open 4-6" Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer >15

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1, south to north

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	5 deg T	SH2B	Tr	2nd growth, balsam fir, hemlock, yellow birch
yes	2	5 deg T	SH2C	Tr	early successional
yes	3	5 deg T	SH2B	P, Tr	2nd growth, residual hemlock
yes	4	5 deg T	SH2B	Tr	2nd growth, residual hemlock
yes	5	5 deg T	SH2B	Tr, P	2nd growth, balsam fir, hemlock, yellow birch
yes	6	5 deg T	SH2C	Tr	early successional, some recent browse on hazelnut
yes	7	5 deg T	SH2C	Tr	residual hemlock
yes	8	5 deg T	SH2C	Tr	residual hemlock
yes	9	5 deg T	SH2C	Tr	Balsam fir, yellow birch, hemlock, red spruce
yes	10	5 deg T	SH2C	Tr	Sugar maple, yellow birch, balsam, red spruce
yes	11	5 deg T	SH3C	Tr	residual hemlock
yes	12	5 deg T	SH3C	none	Mixed 2nd growth
yes	13	5 deg T	SH2C	none	2nd growth
yes	14	5 deg T	HS2C	none	Mixed 2nd growth
yes	15	5 deg T	HS2C	Tr, P	past selective cuts
yes	16	5 deg T	H2C	Tr	3rd growth beech-birch-maple
yes	17	5 deg T	H2C	none	beech-birch-maple
yes	18	5 deg T	HS2C	none	scattered hemlock, balsam fir
yes	19	5 deg T	HS2C	none	
yes	20	5 deg T	SH3C	none	hemlock, bare ground patches
yes	21	5 deg T	SH3C	Tr	broswe on yellow birch
yes	22	5 deg T	SH2C	Tr	
yes	23	5 deg T	SH3C	none	residual hemlock
yes	24	5 deg T	SH3C	none	residual hemlock
yes	25	90 deg T	SH3B	Tr	hemlock stand above river
yes	26	90 deg T	SH3C	Tr	adjacent to river
yes	27	90 deg T	SH3C	none	just off route 2
yes	28	90 deg T	S3C	none	cedar swamp flood plain
yes	29	90 deg T	S3C and river	1Tr	point in Molunkus Stream

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: Frasier # 991502 **Town(s)** Macwahoc **Date:** 3/24/09

Snow Depth: Open 30" Cover 20"

Crew: M. Arsenault, C. Ferris **Sinking:** Open 6" Cover 6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 6-Apr

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 10-14 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Start near Lake Rd and head towards Molunkus Stream, west side of MPC ROW

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	50 degrees true	SH3B	None	adjacent to Lake Rd
yes	2	50 degrees true	HS2C	None	Residual Tsu can, Bet all
yes	3	50 degrees true	HS2C	None	Residual Tsu can; Fag gra saplings
yes	4	50 degrees true	HS2C	None	Ace sac, Tsu can, Abi bal
yes	5	50 degrees true	HS2C	Tr	old tracks, 6" sinking, settled in snow
yes	6	50 degrees true	HS2C	None	Residual Tsu can, Bet all
yes	7	50 degrees true	SH3C	None	Residual Tsu can
yes	8	50 degrees true	SH3C	Tr	old tracks and1 old pellet group
yes	9	50 degrees true	HS2C	None	Residual Tsu can
yes	10	50 degrees true	HS2C	None	Early successional
yes	11	50 degrees true	HS3C	None	Residual Tsu can, Bet all
yes	12	50 degrees true	HS3C	None	Residual Tsu can, Bet all
yes	13	50 degrees true	SH2C	None	Tsu can, Abi bal
yes	14	50 degrees true	SH1C	None	Regen of Tsu can, Abi bal
yes	15	50 degrees true	S2C	Tr	old tracks, regen of Tsu can, Abi bal
yes	16	50 degrees true	S3C	Tr	old tracks along stream
yes	17	50 degrees true	SH3C	Tr	old tracks along stream; residual Tsu can
yes	18	50 degrees true	SH3C	None	Residual Tsu can
yes	19	50 degrees true	SH3C	None	Residual Tsu can
yes	20	50 degrees true	SH3C	None	Residual Thu occ
yes	21	50 degrees true	SH2C	None	Residual Thu occ
yes	22	50 degrees true	S2B	None	Thu occ, Abi bal
yes	23	50 degrees true	HS1C	None	regen of Abi bal, Bet all, Ace sac
yes	24	50 degrees true	S2C	Tr	old tracks, Thu occ woodland
yes	25	50 degrees true	SH2C	None	Residual Tsu can, Pic rub
yes	26	50 degrees true	SH3C	None	Open with residual trees
yes	27	50 degrees true	SH3C	None	Open with residual trees
yes	28	50 degrees true	SH3C	None	Residual Tsu can

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	29	50 degrees true	SH3C	None	Residual Thu occ, Pic rub
yes	30	50 degrees true	SH2C	None	Residual Bet all, Pop tre
yes	31	50 degrees true	SH2C	None	Residucal Tsu can, Abi bal
yes	32	50 degrees true	S3C	None	Residual Tsu can
yes	33	50 degrees true	SH3C	None	
yes	34	50 degrees true	SH3C	Tl, P	old trail, pellet group; residual Tsu can
yes	35	50 degrees true	SH3C	None	Residual Tsu can
yes	36	50 degrees true	SH3C	None	Residual Tsu can
yes	37	50 degrees true	SH3C	None	Residual Tsu can
yes	38	50 degrees true	S3B	None	Thu occ swamp, coyote tracks
yes	39	50 degrees true	S3C	None	Thu occ wetland
yes	40	50 degrees true	SH2C	None	Residual Thu occ, Tsu can
yes	41	50 degrees true	S2B	Tr	Old tracks, Thu occ wetland
yes	42	50 degrees true	S2B	Tl,P	Trails, pellets, beds - not recent
yes	43	50 degrees true	S2C	Tr,Tl, P	activity 5-10 days old along Molunkus Stream

Comments:

Mostly non-DWA - residual Tsu can with hardwoods; Abi bal regen; poor cover in most areas

Thu occ swamp along Molunkus Stream S2B-S3B with active DWA use - tracks, few trails, pellet clumps, few beds; 4-6 deer present

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 991502 **Town(s)** Macwahoc Plantation **Date:** March 9, 2010

Snow Depth: Open 12-18" Cover 6-18"

Crew: M. Arsenault **Sinking:** Open 12" (old) Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer >20

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 3, south to north

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	180 deg T	SH3B	Tr	PFO with cedar-fir
yes	2	180 deg T	SH3B/C	Tr	patchy forest
yes	3	180 deg T	SH3C	none	residual spurce-fir forest
yes	4	180 deg T	SH3C	Tr, P	
yes	5	180 deg T	HS3C	Tr	2nd growth
yes	6	180 deg T	SH2C	none	PFO
yes	7	180 deg T	SH3C	none	2nd growth spruce-fir
yes	8	180 deg T	SH3C	Tr	
yes	9	180 deg T	S1C	none	regen red spruce, fir
yes	10	180 deg T	SH3C	Tr	residual red spruce, sugar maple
yes	11	180 deg T	SH2C	none	
yes	12	180 deg T	SH3C	Tr	residual hemlock
yes	13	180 deg T	S2C	Tr	spruce-fir regen
yes	14	180 deg T	S2C	none	regen spruce bog
yes	15	180 deg T	S2C	none	regen spruce bog
yes	16	180 deg T	S2C	none	regen cedar, black spruce, red spruce
yes	17	180 deg T	S2C	none	regen spruce-fir
yes	18	180 deg T	S2C	none	regen spruce-fir
yes	19	180 deg T	S2C	none	regen spruce-fir
yes	20	180 deg T	S2C	none	regen spruce-fir
yes	21	180 deg T	S2B	none	dense fir regen
yes	22	180 deg T	S2B	Tr	hemlock, cedar, fir
yes	23	180 deg T	SH3C	Tr	2nd growth mixed forest
yes	24	180 deg T	S2B	Tr, P	patchy rd spruce
yes	25	180 deg T	SH3C	Tr	yellow birch, hemlock, red spruce
yes	26	180 deg T	HS2B	none	2nd growth beech-birch-maple
yes	27	180 deg T	HS2C	none	residual red spruce, hemlock
yes	28	180 deg T	HS2C	none	

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	29	180 deg T	HS2C	none	beech-birch-maple with residual hemlock
yes	30	180 deg T	HS2C	none	early successional
yes	31	180 deg T	H1C	none	regen along logging road
yes	32	180 deg T	H1C	none	regen
yes	33	180 deg T	H2C	none	beech-birch-maple
yes	34	180 deg T	HS2C	none	regen stand
yes	35	180 deg T	HS3C	none	2nd growth beech-birch-maple
yes	36	180 deg T	HS2/3C	none	beech-birch-maple
yes	37	180 deg T	HS2C	none	residual tsu can
yes	38	180 deg T	HS2B/C	none	residual hemlock
yes	39	180 deg T	SH2B/C	Tr, P	2nd growth
yes	40	180 deg T	SH2B/C	Tr, P	2nd growth hemlock upland
yes	41	180 deg T	SH2B	none	coyote tracks, PFO
yes	42	180 deg T	SH2B/C	none	PFO
yes	43	180 deg T	SH2C	Tr	
yes	44	180 deg T	S2B	Tr	cedar swamp
yes	45	180 deg T	SH2B	none	PFO
yes	46	220 deg T	HS2C	none	adjacent to logging road
yes	47	220 deg T	SH2B	Tr, P	
yes	48	220 deg T	SH2C	Tr, P	
yes	49	220 deg T	SH2C	Tr, P	hemlock stand
yes	50	220 deg T	SH2C	Tr, P	
yes	51	220 deg T	SH3C	Tr, P	Browse on yellow birch, striped maple
yes	52	220 deg T	SH3B	Tr, P	Browse on yellow birch, striped maple
yes	53	220 deg T	SH3B	Tr, P	hemlock along stream
yes	54	220 deg T	SH3B	Tr, P	adjacent to Little Molunkus stream
yes	55	220 deg T	SH3C	Tr, P	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: Frasier # 991502 **Town(s):** Macwahoc **Date:** 3/24/09

Crew: C. Ferris, M. Arsenault

Snow Dept Open 30" Cover 30"
Sinking: Open 8" Cover 6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 2-3

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect # 2 is the proposed ROW centerline

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	230 deg T	SH 2 B	Tr	next to stream
Y	2	230 deg T	S 2 B	None	
Y	3	230 deg T	S 2 C	Tr	
Y	4	230 deg T	S 2-3 C	Tr, P	
Y	5	230 deg T	HS 2 C	None	
Y	6	230 deg T	S 2 C	None	
Y	7	230 deg T	S 2 C	Tr, P	
Y	8	230 deg T	SH 2 C	None	coyote tracks
Y	9	230 deg T	S2 B	Tr	
Y	10	230 deg T	S 1 C	None	
Y	11	230 deg T	S 1 C	None	
Y	12	230 deg T	S 1 C	None	
Y	13	230 deg T	S 1 C	None	
Y	14	230 deg T	S 1 C	None	
Y	15	230 deg T	S 2 C	None	
Y	16	230 deg T	S 3 C	Tr	next to stream
Y	17	230 deg T	S 3 C	None	
Y	18	230 deg T	S 2 C	None	
Y	19	230 deg T	S 2 C	None	
Y	20	230 deg T	S 2 C	None	
Y	21	230 deg T	S 2 C	None	
Y	22	230 deg T	SH 2 C	None	
Y	23	230 deg T	SH 3 C	None	
Y	24	230 deg T	SH 3 C	None	
Y	25	230 deg T	SH 3 C	None	
Y	26	230 deg T	SH 3 C	None	
Y	27	230 deg T	SH 3 C	None	
Y	28	230 deg T	S 3 C	None	
Y	29	230 deg T	S 3 C	None	
Y	30	230 deg T	SH 3 C	None	
Y	31	230 deg T	HS 3 C	None	
Y	32	230 deg T	SH 3 C	None	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 991502 **Town(s)** Macwahoc Plantation **Date:** March 9, 2010

Snow Depth: Open 12-18" Cover 6-18"

Crew: M. Arsenault **Sinking:** Open 12" (old) Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer >20

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 2, south to north

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	0 deg T	SH3B	Tr	Hemlock stand
yes	2	0 deg T	SH3C	Tr, P	
yes	3	0 deg T	SH3C	Tr, P	
yes	4	0 deg T	SH3C	Tr	residual hemlock, yellow birch
yes	5	0 deg T	SH3C	Tr	edge of PFO
yes	6	0 deg T	S3B	Tr	narrow hemlock stand
yes	7	0 deg T	S3B/C	Tr, P	edge of PFO
yes	8	0 deg T	S2C	Tr	cedar swamp
yes	9	0 deg T	S2B	Tr	cedar swamp
yes	10	0 deg T	S2B/C	none	cedar swamp
yes	11	0 deg T	S2C	Tr	cedar swamp
yes	12	0 deg T	SH2B	Tr	PFO, thick balsam regen
yes	13	0 deg T	SH2C	Tr	PFO
yes	14	0 deg T	SH3C	Tr	thick understory
yes	15	0 deg T	SH2C	Tr	
yes	16	0 deg T	SH2C	Tr	red spruce more abundant
yes	17	0 deg T	HS2C	Tr	
yes	18	0 deg T	HS2C	Tr	beech-birch-maple
yes	19	0 deg T	HS2C	none	
yes	20	0 deg T	HS23C	none	adjancent to log trail
yes	21	0 deg T	HS3C	none	
yes	22	0 deg T	HS3C	none	
yes	23	0 deg T	HS3C	none	beech-birch-maple with hemlock and red spruce
yes	24	0 deg T	HS3C	none	beech-birch-maple
yes	25	0 deg T	HS3C	Tr	beech-birch-maple
yes	26	0 deg T	HSC	none	beech-birch-maple
yes	27	0 deg T	HS3C	none	beech-birch-maple with residual hemlock
yes	28	0 deg T	HS3C	none	2nd growth beech-birch-maple
yes	29	90 deg T	H2C	none	2nd growth beech-birch-maple
yes	30	90 deg T	SH3C	Tr	adjacent to river
yes	31	90 deg T	not forested	none	river
yes	32	90 deg T	not forested	none	river
yes	33	90 deg T	S3A	none	hemlock stand along river
yes	34	90 deg T	HS3C	none	pfo
yes	35	90 deg T	HS3C	none	PFO
yes	36	90 deg T	HS1C	none	beaver pond
yes	37	90 deg T	S2C	none	cedar swamp

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 991502 **Town(s)** Macwahoc Plantation **Date:** March 9, 2010

Snow Depth: Open 12-18" Cover 6-18"

Crew: M. Arsenault, T. Tetreau **Sinking:** Open 12" (old) Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 5 (most likely traveling through)

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 4, north to south

In DWA?	Chains	Bearing T/M?		Forest Type	Deer Sign	Remarks
yes	1	~150º True		SH2B	none	
yes	2	~150º True		SH2B	none	coyote track
yes	3	~150º True		SH2B	none	
yes	4	~150º True		HS2C	none	
yes	5	~150º True		HS2B	none	
yes	6	~150º True		HS2C	none	
yes	7	~150º True		HS2C	none	
yes	8	~150º True		HS2B	none	
yes	9	~150º True		SH2B	none	
yes	10	~150º True		S2B	none	cedar, yellow birch, hemlock PFO
yes	11	~150º True		S2B	none	cedar, yellow birch, hemlock PFO
yes	12	~150º True		S2B	none	along river
yes	13	~150º True		S2B	none	along river, crossed tributary
yes	14	~150º True		S2B	none	along river
yes	15	~150º True		S2B	none	along river
yes	16	~150º True		S2B	5 Tr	along river
yes	17	~150º True		S2B	none	
yes	18	~150º True		SH2B	none	
yes	19	~150º True		SH2B	none	
yes	20	~150º True		SH2C	none	
yes	21	~150º True		HS2C	none	
yes	22	~150º True		HS2C	none	
yes	23	~150º True		HS2C	1Tr	
yes	24	~150º True		HS2C	3Tr	
yes	25	~150º True		SH3C	Tr	residual hemlock, yellow birch
yes	26	~150º True		SH3C	Tr	residual hemlock, yellow birch
yes	27	~150º True		SH3C	Tr	residual hemlock, yellow birch
yes	28	~150º True		SH3B	Tr	Hemlock stand
yes	29	~150º True		SH3C	none	residual hemlock, yellow birch
yes	30	~150º True		SH3B	Tr	along river

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 991502 **Town(s)** Macwahoc Plantation **Date:** March 9, 2010

Snow Depth: Open 12-18" Cover 6-18"

Crew: T. Tetreau **Sinking:** Open 4-6" Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer ~3-5

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Trransect 5; Start at East end of Transect 5 at Molunkus Stream, working West.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	~270º True	S2B	None	skipped first point - located in Molunkus Stream
yes	2	~270º True	S2B	None	cedar and hemlock PFO
yes	3	~270º True	S2B	None	cedar and hemlock PFO
yes	4	~270º True	HS3C	None	
yes	5	~270º True	HS3C	None	
yes	6	~270º True	HS2C	None	
yes	7	~270º True	HS2C	None	
yes	8	~270º True	HS2C	None	
yes	9	~270º True	SH2B	None	
yes	10	~270º True	SH2B	None	
yes	11	~270º True	SH2B	1P, 2Tr, 1Bd	
yes	12	~270º True	S2B	None	
yes	13	~270º True	H2C	1Tl, 1P, 3Tr	
yes	14	~270º True	H2C	None	
yes	15	~270º True	H2C	None	
yes	16	~270º True	H2C	None	
yes	17	~270º True	H2C	None	at road

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 991502 **Town(s)** Macwahoc Plantation

Snow Depth: Open 12-18" Cover 6-18"

Crew: T. Tetreau **Sinking:** Open 4-6" Cover 4-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer >30

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Start at South end of transect 6 working North, ending at North end at Molunkus Stream

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	~355º True	SH2B	None	
yes	2	~355º True	SH2B	6P, 1Tl	Trail has multiple scattered tracks around it
yes	3	~355º True	S2B	3P, 1Tr	
yes	4	~355º True	S2B	6P, 1Tl, 4Tr	
yes	5	~355º True	S2B	10P, 10Tr	
yes	6	~355º True	SH2B	8P, 10Tr	
yes	7	~355º True	S2B	14P, 7Tr	
yes	8	~355º True	S2B	6P, 1Tl, 6Tr	
yes	9	~355º True	S2B	2Tr	
yes	10	~355º True	S2B	8P, 9Tr	
yes	11	~355º True	S2B	4Tr, 1P	
yes	12	~355º True	HS2C	3Tr, 1P	
yes	13	~355º True	HS2C	1P, 1Tr	
yes	14	~355º True	SH2B	8P, 2Tl, 6Tr	deer kill just to East of transect
yes	15	~355º True	SH2C	3Tr	traveling downslope through maple, hemlock forest to strea
yes	16	~355º True	S2A	2Tr	near Little Molunkus stream
yes	17	~355º True	S2A	3Tr	at Little Molunkus Stream
yes	18	~355º True	S2B	2Tr	crossed Little Molunkus Stream
yes	19	~90º True	S2B	2Tl, 2Tr	
yes	20	~90º True	SH2B	1Tl, 2Tr	
yes	21	~90º True	SH2B	1Tl, 2P	crossed old road
yes	22	~90º True	S2B	2Tr, 1P	coyote tracks
yes	23	~90º True	S2B	1Tl, 2P	
yes	24	~90º True	SH2C	None	
yes	25	~0º True	SH2B	None	
yes	26	~0º True	SH2B	5Tr, 2P	coyote tracks
yes	27	~0º True	SH2B	None	
yes	28	~0º True	HS2C	None	at road
yes	29	~0º True	H1C	None	roadside regen
yes	30	~0º True	HS2C	2P, 3Tr	hare pellets observed
yes	31	~0º True	H2C	None	
yes	32	~0º True	HS2C	None	
yes	33	~0º True	SH2B	None	crossed stream

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	34	~0º True	S2B	None	moose track
yes	35	~0º True	SH2B	1Tl	trail on side slope above wetland area
yes	36	~0º True	SH2B	1Tl	
yes	37	~0º True	H1C	None	crossed road, quaking poplar regen
yes	38	~0º True	H2C	2Tr	
yes	39	~0º True	HS2C	2Tr	
yes	40	~0º True	HS2C	1Tr	
yes	41	~0º True	HS2C	3Tr	
yes	42	~0º True	HS2C	1Tr, 1P	
yes	43	~0º True	SH2C	None	
yes	44	~0º True	SH2C	None	
yes	45	~0º True	SH2C	None	
yes	46	~0º True	SH2B	None	
yes	47	~0º True	SH2B	2Tr	
yes	48	~0º True	HS1C	None	crossed road
yes	49	~0º True	H1C	1Tl	trail crossed road
yes	50	~0º True	SH1C	None	
yes	51	~0º True	S1C	None	balsam fir regen
yes	52	~0º True	SH2C	1P, 1Tr	
yes	53	~0º True	SH2B	None	
yes	54	~0º True	SH2B	None	
yes	55	~0º True	SH2B	None	
yes	56	~0º True	SH2B	None	crossed boundary line
yes	57	~0º True	SH2B	1Tl, 2P	
yes	58	~0º True	SH2B	2Tr	
yes	59	~0º True	SH2B	2Tr	
yes	60	~0º True	SH2B	None	
yes	61	~0º True	SH2B	None	
yes	62	~0º True	SH2B	1Tr	
yes	63	~0º True	SH2B	1Tr	
yes	64	~0º True	SH2C	6Tr	
yes	65	~0º True	SH2C	2Tr	
yes	66	~0º True	SH2C	5Tr, 1P	
yes	67	~0º True	SH1C	2Tr	
yes	68	~0º True	H1C	None	old log yard
yes	69	~0º True	H1C	None	old log yard
yes	70	~0º True	SH3B	6Tr, 1P, 1Bd	
yes	71	~0º True	SH2B	2Tr	
yes	72	~0º True	SH2C	None	
yes	73	~0º True	SH2B	None	
yes	74	~0º True	S2A	None	cedar swamp
yes	75	~0º True	S2B	None	cedar swamp
yes	76	~0º True	SH2B	None	crossed stream
yes	77	~0º True	SH2B	1Tr	
yes	78	~0º True	SH2B	None	
yes	79	~0º True	SH2B	None	
yes	80	~275º True	S2B	None	
yes	81	~275º True	SH2B	1Tr, 1P	
yes	82	~275º True	S2B	1P	
yes	83	~275º True	SH2B	None	crossed stream
yes	84	~275º True	SH2B	None	
yes	85	~275º True	SH2B	4P, 3Tr	traveling along a small ridge
yes	86	~275º True	SH2B	None	crossed stream
yes	87	~275º True	SH2B	None	
yes	88	~275º True	SH2B	None	
yes	89	~275º True	SH2C	None	
yes	90	~275º True	SH2C	2P	
yes	91	~315º True	SH2B	2P, 2Tr	
yes	92	~315º True	SH2B	None	
yes	93	~315º True	SH2B	None	
yes	94	~315º True	SH2B	None	crossed road

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	95	~315º True	SH2C	None	
yes	96	~315º True	SH2B	1P, 1Tr	
yes	97	~315º True	SH2B	1Tl, 4P	
yes	98	~315º True	SH2B	3P, 2Tr	
yes	99	~315º True	SH2B	1Tr	
yes	100	~315º True	SH2B	None	
yes	101	~315º True	SH2B	1P	
yes	102	~350º True	SH2B	2P	
yes	103	~350º True	H2C	None	
yes	104	~350º True	HS2C	None	
yes	105	~350º True	HS2C	None	
yes	106	~350º True	HS2C	None	
yes	107	~90º True	HS2C	None	
yes	108	~90º True	HS2C	None	
yes	109	~90º True	HS2C	None	
yes	110	~90º True	HS2C	1P	
yes	111	~90º True	SH2C	None	
yes	112	~90º True	SH2B	None	
yes	113	~90º True	S2B	None	cedar swamp
yes	114	~90º True	S2B	None	cedar swamp
yes	115	~90º True	S2B	None	cedar swamp
yes	116	~90º True	S2B	None	cedar swamp
yes	117	~90º True	S3A	1P, 2Tr	cedar and hemlock
yes	118	~90º True	SH2B	None	
yes	119	~90º True	SH2B	1P	
yes	120	~90º True	SH2C	None	
yes	121	~90º True	SH2B	None	
yes	122	~90º True	SH2B	None	
yes	123	~90º True	SH2B	None	
yes	124	~90º True	SH2C	None	
yes	125	~90º True	SH2B	2Tr	
yes	126	~90º True	S2B	None	
yes	127	~90º True	S2B	2Tr, 1P	at Molunkus Stream

Comments: No fresh trails or tracks. Some fresh tracks observed on trail used to access DWA.
Multiple trails and tracks crossing Little Molunkus Stream and paralleling on both banks.

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100195 **Town(s)** Mattawamkeag **Date:** 3/19/2009

Snow Depth: Open 30+" Cover

Crew: M. Arsenault, C. Ferris **Sinking:** Open 12" Cover
tracks have settled

Were snowshoe hares: Rare X Common Abundant Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd
WSI>60

Starting Point(s): Transect 1 @ Lake Road DWA, Chain 1, 240º

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	240º	HS2C	none	hardwood regen
Y	2	240º	HS2C	none	
Y	3	240º	HS2C	none	
Y	4	240º	SH2C	none	
Y	5	240º	HS2C	none	
Y	6	240º	HS2C	none	
Y	7	240º	HS2C	none	
Y	8	240º	HS2C	none	
Y	9	240º	SH2C	Tl	deer trail across transect, no recent use
Y	10	240º	S2C	none	
Y	11	240º	S2C	none	

Comments:
Poor cover throughout; harvested forest along transect; residual Pin str, Ace sac, Pic rub, Thu occ, Tsu can
Understory regen of Pop tre, Abi bal, Fag gra, Pic rub

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100195 **Town(s)** Mattawamkeag **Date:** 3/19/09

Snow Depth: Open 30+" Cover

Crew: M. Arsenault, C. Ferris **Sinking:** Open 6-8" Cover
tracks have settled

Were snowshoe hares: Rare X Common Abundant Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd
WSI>60

Starting Point(s): Transect 2 @ Lake Road DWA, Chain 1, 60º

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	60º	SH3C	Tl	deer trail - old, settled in snow, 6" sinking
Y	2	60º	H3C	none	residual trees
Y	3	60º	H3C	none	residual trees
Y	4	60º	H3C	none	
Y	5	60º	HS3C	none	
Y	6	60º	HS3C	Tr, P	Abi bal saplings, 1 clump of pellets, tracks have settled
Y	7	60º	H3C	none	

Comments:
No suitable DWA cover; residual mixed forest - past harvests in forest
Ace sac, Tsu can, Pin str, Bet all trees and regen present

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100195 **Town(s)** Mattawamkeag Date: 3/19/09

Snow Depth: Open 30+" Cover 30+"

Crew: M. Arsenault, C. Ferris **Sinking:** Open n/a Cover n/a

Were snowshoe hares: Rare X Common ____ Abundant ____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes ____ No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd ____
WSI>60 ____

Starting Point(s): Transect 3 @ Lake Road DWA, Chain 1, 60º

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	60º	HS2C	none	
Y	2	60º	SH2C	none	
Y	3	60º	SH2C	none	
Y	4	60º	SH3C	none	adjacent to Mattaseunk Stream
Y	5	60º	SH3C	none	east side of Mattaseunk Stream
Y	6	60º	SH3C	none	residual Tsu can, Bet pop, regen
Y	7	60º	S3C	none	residual Tsu Can, Thu occ, Bet all

Comments:

Residual conifer forest; Thu occ along stream, patchy from past harvestrs; no suitable cover

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100195 **Town(s):** Mattawamkeag **Date:** 3/19/09

Crew: C. Ferris, M. Arsenault

Snow Dept Open 30" Cover 30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare X Common ____ Abundant ____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes ____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd ____
WSI>60 ____

Starting Point(s): Transect #4 is the north transect on the east side of Lake Road.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	60 deg T	SH 2 B	None	next to road
Y	2	60 deg T	H 1 C	None	
Y	3	60 deg T	SH 2 B	None	
Y	4	60 deg T	SH 2 B	None	
Y	5	60 deg T	SH 2 B	None	
Y	6	60 deg T	S 2 A	None	west side of Mattaseunk Stream,

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: Frasier # 992202 **Town(s):** Reed Plt (North) **Date:** 3/23/09

Crew: C. Ferris, M. Arsenault

Snow Deptl Open 30" Cover 30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect # 2 is on the far west side of the T-line

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	30 deg T	S 2 C	None	
Y	2	30 deg T	S 2 B	None	
Y	3	30 deg T	S 2 C	None	
Y	4	30 deg T	S 2 B	None	
Y	5	30 deg T	S 2 B	None	
Y	6	30 deg T	S 2 C	None	
Y	7	30 deg T	SH 2 C	None	
Y	8	30 deg T	SH 2 C	None	
Y	9	30 deg T	S 2 B	None	
Y	10	30 deg T	S 2 B	None	
Y	11	30 deg T	S 1 C	None	
Y	12	30 deg T	S 1 C	None	
Y	13	30 deg T	S 1 C	None	
Y	14	30 deg T	S 1 C	None	
Y	15	30 deg T	S 2 C	None	
Y	16	30 deg T	SH 2 C	None	
Y	17	30 deg T	SH 2 C	None	
Y	18	30 deg T	SH 2 C	None	
Y	19	30 deg T	S 2 C	None	
Y	20	30 deg T	S 2 C	None	
Y	21	30 deg T	S 2 C	None	
Y	22	30 deg T	S 2 C	None	
Y	23	30 deg T	S 2 C	None	Thick understory regen
Y	24	30 deg T	S 2 C	None	
Y	25	30 deg T	SH 2 C	None	
Y	26	30 deg T	SH 2 C	None	
Y	27	30 deg T	SH 2 C	None	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: Frasier # 992301 **Town(s):** Reed Plt (South) **Date:** 3/23/09

Crew: C. Ferris, M. Arsenault

Snow Deptl Open 30" Cover 30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect # 2 is on the east side of the T-line.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	35 deg T	SH 2 C	None	
Y	2	35 deg T	SH 2 C	None	
Y	3	35 deg T	SH 2 C	None	
Y	4	35 deg T	SH 2 C	None	
Y	5	35 deg T	SH 2 C	None	
Y	6	35 deg T	SH 1 C	None	
Y	7	35 deg T	SH 1 C	None	
Y	8	35 deg T	S 2 C	None	
Y	9	35 deg T	S 2 C	None	
Y	10	35 deg T	S 2 C	None	south side of stream
Y	11	35 deg T	SH 2 C	None	north side of stream
Y	12	35 deg T	HS 2 C	None	
Y	13	35 deg T	S 2 B	None	
Y	14	35 deg T	S 2 B	None	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region:_____

DWA #: Frasier # 992202 **Town(s)** Reed Plantation (Reed north) **Date:** 3/23/2009

Snow Depth: Open 35" Cover 28+"

Crew: M. Arsenault, C. Ferris **Sinking:** Open NA Cover NA

Were snowshoe hares: Rare _____ Common X Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches greater than 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1 Reed north

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	30 degrees true	S1C	None	Abi bal regen
yes	2	30 degrees true	SH2C	None	Abi bal, Pop tre
yes	3	30 degrees true	S2C	None	Thu occ, Abi bal
yes	4	30 degrees true	S2B	None	Thick Abi bal saplings
yes	5	30 degrees true	S2B	None	Pic rub, Thu occ, Tsu can, with Abi bal regen
yes	6	30 degrees true	S3C	None	Open Tsu can and Thu occ
yes	7	30 degrees true	S3C	None	Open Thu occ, Pic rub
yes	8	30 degrees true	S2C	None	Regen Abi bal, residual Tsu can
yes	9	30 degrees true	S2C	None	Open Thu occ woodland with old browse
yes	10	30 degrees true	S2C	None	Spruce woodland bog
yes	11	30 degrees true	S1C	None	Spruce bog
yes	12	30 degrees true	S2C	None	Thu occ woodland
yes	13	30 degrees true	S2C	None	Abi bal regen, snowshoe hare present
yes	14	30 degrees true	S1B	None	Dense Abi bal saplings
yes	15	30 degrees true	S1C	None	Abi bal saplings
yes	16	30 degrees true	S1C	None	Abi bal regen
yes	17	30 degrees true	SH2C	None	Abi bal regen, Pop tre trees
yes	18	30 degrees true	S1C	None	Clearing with Abi bal regen
yes	19	30 degrees true	S2C	None	Dense Abi bal regen, residual Pic rub
yes	20	30 degrees true	SH2C	None	Dense Abi bal saplings, residual Tsu can
yes	21	30 degrees true	S1B	None	Dense Abi bal saplings
yes	22	30 degrees true	S1C	None	Dense Abi bal, residual Tsu can
yes	23	30 degrees true	HS2C	None	Early successional, Abi bal regen, Pop tre
yes	24	30 degrees true	SH2C	None	Residual Pic rub; dense Abi bal, Pic rub

Comments:
Very little suitable softwood cover; transect has been disturbed through past harvests - most suitable cover has been removed
Dense Abi bal regen in most areas with residual Tsu can, Thu occ, and Pic rub

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992202 **Town(s)** Reed Plantation **Date:** March 8, 2010

Snow Depth: Open 24" Cover 12-18"

Crew: M. Arsenault **Sinking:** Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1; SW to NE; start along unnamed logging road

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	55 deg T	SH2C	None	2nd growth, red spruce, hemlock, yellow birch
yes	2	55 deg T	SH2C	None	mixed second growth
yes	3	55 deg T	SH2C	None	hemlock, sugar maple, yellow birch
yes	4	55 deg T	SH2C	None	hemlock, sugar maple, yellow birch
yes	5	55 deg T	SH3B	None	mature hemlock
yes	6	55 deg T	SH2C	None	denser regen of yellow birch, balsam fir
yes	7	55 deg T	S3B/C	None	residual red spruce, hemlock
yes	8	55 deg T	S3B/C	None	residual red spruce, hemlock
yes	9	55 deg T	S2B	None	cedar with balsam fir regen
yes	10	55 deg T	S2B	None	cedar with balsam fir regen
yes	11	55 deg T	SH2C	None	residual hemlock
yes	12	55 deg T	S3C	None	residual hemlock
yes	13	55 deg T	S3B	None	mature cedar and hemlock
yes	14	55 deg T	S2C	None	regen of balsam fir, cedar
yes	15	55 deg T	SH1C	None	regen of balsam fir; alder
yes	16	55 deg T	SH1C	None	regen of balsam fir; alder
yes	17	55 deg T	SH2C	None	residual cedar
yes	18	55 deg T	S1C	None	balsam fir regen
yes	19	55 deg T	SH1C	None	regen
yes	20	55 deg T	SH1C	None	regen
yes	21	55 deg T	SH2C	None	early successional
yes	22	55 deg T	SH1B	None	balsam fir regen
yes	23	55 deg T	SH1C	None	regen
yes	24	55 deg T	SH1C	None	regen, dense balsam fir
yes	25	20 deg T	S1C	None	regen, residual hemlock
yes	26	20 deg T	S1C	None	regen, dense balsam fir
yes	27	20 deg T	SH2C	None	residual hemlock
yes	28	20 deg T	HS2C	None	early successional
yes	29	20 deg T	SH1C	None	early successional
yes	30	20 deg T	SH1C	None	early successional

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992202 **Town(s)** Reed Plantation **Date:** March 8, 2010

Snow Depth: Open 24" Cover 12-18"

Crew: M. Arsenault **Sinking:** Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 3; SW to NE; start along unnamed logging road

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	55 deg T	not forested	None	across road
yes	2	55 deg T	S1B	None	regen balsam fir
yes	3	55 deg T	S3B	None	residual hemlock. Skid trails
yes	4	55 deg T	S3B	None	hemlock, balsam
yes	5	55 deg T	HS2C	None	2nd growth
yes	6	55 deg T	SH2C	None	
yes	7	55 deg T	S2B	None	2nd growth
yes	8	55 deg T	SH3B	None	yellow birch, hemlock, balsam
yes	9	55 deg T	S2B	None	cedar, hemlock, red spruce
yes	10	55 deg T	S3B	None	balsam fir, red spruce
yes	11	55 deg T	S3B/C	None	residual hemlock
yes	12	55 deg T	S3B/C	None	dense regen, 2nd growth
yes	13	55 deg T	S2B	None	2nd growth with dense balsam fir
yes	14	55 deg T	S3B	None	dense red spruce; balsam fir regen
yes	15	55 deg T	SH3C	None	PFO with alder understory
yes	16	55 deg T	S2C	None	cedar swamp
yes	17	55 deg T	S2C	None	edge of regen and cedar swamp
yes	18	55 deg T	S1C	None	regen PFO
yes	19	55 deg T	S1C	None	regen PFO
yes	20	55 deg T	S1B	None	dense balsam fir regen
yes	21	55 deg T	S2B	None	2nd growth balsam fir
yes	22	55 deg T	S1C	None	regen cedar wetland
yes	23	55 deg T	S1C	None	regen cedar wetland
yes	24	55 deg T	S1C	None	regen spruce upland
yes	25	55 deg T	S1C	None	regen PFO- balsam and cedar, skid trails
yes	26	20 deg T	S1C	None	regen PFO- balsam and cedar
yes	27	20 deg T	S1C	None	regen PFO- balsam and cedar
yes	28	20 deg T	HS2C	None	early successional
yes	29	20 deg T	SH2C	None	early successional

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992202 **Town(s)** Reed Plantation **Date:** March 8, 2010

Snow Depth: Open 24" Cover 12-18"

Crew: M. Arsenault **Sinking:** Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 4, NE to SW; end along unnamed logging road

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	200 deg T	SH2C	None	early successional
yes	2	200 deg T	HS2C	None	early successional
yes	3	200 deg T	S2B	None	residual hemlock
yes	4	200 deg T	S1B	None	2nd growth balsam fir
yes	5	200 deg T	S1B	None	2nd growth balsam fir
yes	6	225 deg T	SH1C	None	early successional
yes	7	225 deg T	S1C	None	regen balsm fir
yes	8	225 deg T	S1C	None	regen balsm fir
yes	9	225 deg T	S1C	None	residual red spruce
yes	10	225 deg T	S1C	None	balsm fir regen
yes	11	225 deg T	SH2C	None	early successional
yes	12	225 deg T	S2B	None	2nd growth red spruce, balsam fir
yes	13	225 deg T	SH2C	None	early successional
yes	14	225 deg T	S2C	None	cedar swamp, dense balsam fir
yes	15	225 deg T	S2B	None	cedar swamp
yes	16	225 deg T	S2A	None	cedar swamp, good cover, historic browse
yes	17	225 deg T	SH2C	None	early successional
yes	18	225 deg T	HS2C	None	early successional
yes	19	225 deg T	S2B	None	balsam fir regen; residual hemlock
yes	20	225 deg T	SH2C	None	early successional; residual hemlock
yes	21	225 deg T	S2C	None	regen balsm fir
yes	22	225 deg T	S3B	None	mature hemlock
yes	23	225 deg T	SH3C	None	residual stand, skid trails
yes	24	225 deg T	SH3C	None	residual stand, skid trails
yes	25	225 deg T	S3B	None	mature hemlock

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992202 **Town(s)** Reed Plantation **Date:** March 8, 2010

Snow Depth: Open 24" Cover 12-18"

Crew: T. Tetreau **Sinking:** Open 3-6" Cover 3-6"

Were snowshoe hares: Rare _____ Common X Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches _____

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 5, Start at Northeast end of Transect 5, working Southwest

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	~230º True	H1C	None	old log road
yes	2	~230º True	H1C	None	white ash and sugar maple regen
yes	3	~230º True	SH1C	None	multiple moose tracks
yes	4	~230º True	SH1C	None	hare pellets and tracks
yes	5	~230º True	S1C	None	hare pellets and tracks
yes	6	~230º True	S1C	None	hare pellets and tracks
yes	7	~230º True	S2B	None	
yes	8	~230º True	S2C	None	
yes	9	~230º True	SH2C	None	
yes	10	~230º True	SH3B	None	
yes	11	~230º True	SH3B	None	
yes	12	~230º True	S2B	None	cedar swamp
yes	13	~230º True	S2B	None	cedar swamp
yes	14	~230º True	S2B	None	cedar swamp with thick balsam fir understory
yes	15	~230º True	S2B	None	cedar swamp with thick balsam fir understory
yes	16	~230º True	SH2B	None	crossed stream
yes	17	~230º True	SH2B	None	
yes	18	~230º True	HS2B	None	old road and camp
yes	19	~230º True	HS2C	None	
yes	20	~230º True	HS2C	None	
yes	21	~230º True	HS2C	None	
yes	22	~230º True	SH2C	None	
yes	23	~230º True	SH2B	None	
yes	24	~230º True	SH2B	None	moose pellets and tracks
yes	25	~230º True	SH2B	None	
yes	26	~230º True	SH2B	None	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992202 **Town(s)** Reed Plantation **Date:** March 8, 2010

Snow Depth: Open 24" Cover 12-18"

Crew: T. Tetreau **Sinking:** Open 3-6" Cover 3-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches _____

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 6; Start at Southwest end of transect 6, working Northeast.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Yes	1	~50º True	HS2C	None	
Yes	2	~50º True	HS2C	None	old moose track
Yes	3	~50º True	HS2C	None	
Yes	4	~50º True	HS2C	None	
Yes	5	~50º True	HS2C	None	
Yes	6	~50º True	HS2C	None	
Yes	7	~50º True	S2B	None	Eastern hemlock and balsam fir
Yes	8	~50º True	S2B	None	hare pellets, crossed stream
Yes	9	~50º True	S2B	None	
Yes	10	~50º True	S2B	None	crossed old road
Yes	11	~50º True	SH2C	None	
Yes	12	~50º True	SH2C	None	
Yes	13	~50º True	SH2B	None	
Yes	14	~50º True	SH2B	None	
Yes	15	~50º True	S2B	None	
Yes	16	~50º True	SH2C	None	moose tracks, pellets, browse
Yes	17	~50º True	SH2B	None	moose tracks, pellets, browse
Yes	18	~50º True	H3C	None	white ash and sugar maple slope
Yes	19	~50º True	H3C	None	white ash and sugar maple slope

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 992202 **Town(s)** Reed Plantation **Date:** March 8, 2010

Snow Depth: Open 24" Cover 12-18"

Crew: T. Tetreau **Sinking:** Open 3-6" Cover 3-6"

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches _____

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 7; Start at Northwest end of transect 7, working Southeast.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	~110º True	SH2C	None	crossed stream
yes	2	~110º True	S2B	None	
yes	3	~110º True	S2A	None	
yes	4	~110º True	S2B	None	
yes	5	~110º True	SH2B	None	
yes	6	~110º True	S1B	None	
yes	7	~110º True	S1C	None	crossed stream
yes	8	~110º True	S1C	None	Includes Alder swamp PSS area
yes	9	~110º True	S2C	None	
yes	10	~110º True	S1B	None	
yes	11	~110º True	SH2B	None	
yes	12	~110º True	S2A	None	thick balsam fir
yes	13	~110º True	S2A	None	thick balsam fir
yes	14	~110º True	S2A	None	thick balsam fir

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: Frasier # 992301 **Town(s)** Reed Plantation (Reed south) **Date :** 3/23/09

Snow Depth: Open 30" Cover 30"

Crew: M. Arsenault, C. Ferris **Sinking:** Open NA Cover NA

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches greater than 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): transect # 1 Reed south; chains 1-9 along propsoed t-line

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	30 degrees true	HS2C	None	Early successional
yes	2	30 degrees true	HS2C	None	Early successional
yes	3	30 degrees true	HS3C	None	Early successional, residual Tsu can
yes	4	30 degrees true	HS2C	None	Early successional
yes	5	30 degrees true	HS2C	None	Residual Tsu can, Bet all
yes	6	30 degrees true	SH3C	None	Residual Tsu can, Bet all
yes	7	30 degrees true	SH3C	None	Residual Tsu can, Pop tre
yes	8	30 degrees true	SH3C	None	Residual Tsu can
yes	9	320 degrees true	SH2C	None	Abi bal saplings, residual Tsu can
yes	10	320 degrees true	S3B	None	Tsu can, Bet all
yes	11	320 degrees true	S3B	None	moose tracks
yes	12	320 degrees true	S3B	None	Tsu can, Pic rub
yes	13	320 degrees true	SH3B	None	Tsu can, Pop tre
yes	14	320 degrees true	S2B	None	Tsu can, Pic rub
yes	15	320 degrees true	S3B	None	Tsu can, Pic rub
yes	16	320 degrees true	S3B	None	Tsu can, Pic rub
yes	17	320 degrees true	S3B	None	Tsu can, Pic rub
yes	18	320 degrees true	S3B	None	Tsu can, Pic rub
yes	19	320 degrees true	S3B	None	Tsu can, Pic rub

Comments:

Close to MPC ROW, transect lacks suitable softwood cover- past harvests and hardwood dominated

As transects veers away from MPC ROW, forest becomes more suitable DWA - dominate dby S3B stands of mature Pic rub and Tsu can with regen of Abi bal; understory open; no deer use

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100071 **Town(s)** T3 R3 WELS (north) **Date:** March 10, 2010

Snow Depth: Open 12-18" Cover 12-20"

Crew: M. Arsenault **Sinking:** Open NA Cover 4-6" (old)

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer ~1-2

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1, south to north

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	0 deg. T	HS2C	none	2nd growth spruce-northern hardwoods
yes	2	0 deg. T	HS2C	none	2nd growth
yes	3	0 deg. T	S3B	none	red spruce stand
yes	4	0 deg. T	SH2B	none	hemlock, red spruce, yellow birch PFO
yes	5	0 deg. T	SH3C	none	past harvests
yes	6	0 deg. T	SH3C	Tr	snowmobile trail through DWA
yes	7	0 deg. T	SH3B	Tr	hemlock, balsam fir, yellow birch
yes	8	0 deg. T	SH3B	Tr	2nd growth

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100071 **Town(s)** T3 R3 WELS (north) **Date:** March 10, 2010

Snow Depth: Open 12-18" Cover 12-20"

Crew: M. Arsenault and T. Tetreau **Sinking:** Open NA Cover 4-6" (old)

Were snowshoe hares: Rare _____ Common _____ Abundant X Est. # of Deer ~1-2

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 2, SE to NW

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	290 deg T	SH3C	none	2nd growth
yes	2	290 deg T	SH3B	none	coyote tracks, red spruce, hemlock
yes	3	290 deg T	SH3C	none	
yes	4	290 deg T	S2B	none	red spruce, hemlock, cedar - maturing
yes	5	290 deg T	S1B	none	dense fir and spruce regen
yes	6	345 deg T	S1A	none	dense fir and spruce regen
yes	7	345 deg T	S1A	none	dense fir and spruce regen
yes	8	345 deg T	S2B	none	abundant hare sign, thick balsam fir and spruce
yes	9	345 deg T	S2B	none	abundant hare sign, thick balsam fir and spruce
yes	10	345 deg T	S1B	none	abundant hare sign, thick balsam fir and spruce
yes	11	345 deg T	S1B	none	abundant hare sign, thick balsam fir and spruce
yes	12	345 deg T	S1B	none	abundant hare sign

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100071 **Town(s)** T3 R3 WELS (north) **Date:** March 10, 2010

Snow Depth: Open 12-18" Cover 12-20"

Crew: T. Tetreau **Sinking:** Open NA Cover 4-6" (old)

Were snowshoe hares: Rare _____ Common _____ Abundant X Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Start at South end of transect 3, working North.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	~355º True	S2B	none	starts on edge of large PSS alder swamp with stream
yes	2	~355º True	S2A	none	crossed road
yes	3	~355º True	S3A	none	thick balsam fir understory in cedar, spruce forest
yes	4	~355º True	S2B	none	moose tracks
yes	5	~355º True	S2B	none	hare pellets observed
yes	6	~355º True	S3B	none	understory opens up in spruce, cedar, fir forest
yes	7	~355º True	S3B	none	cedar swamp
yes	8	~355º True	S3B	none	moose tracks
yes	9	~355º True	S3B	none	
yes	10	~355º True	S3B	none	
yes	11	~355º True	S1A	none	abundant hare sign, thick balsam fir
yes	12	~355º True	S1B	none	abundant hare sign, thick balsam fir
yes	13	~355º True	S2B	none	abundant hare sign, thick balsam fir
yes	14	~355º True	S2B	none	
yes	15	~355º True	S2B	none	thick balsam fir regen

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100068 **Town(s)** T3 R3 WELS (south) **Date:** March 10, 2010

Snow Depth: Open 12-18" Cover 12-20"

Crew: M. Arsenault, T. Tetreau **Sinking:** Open NA Cover 4-6" (old)

Were snowshoe hares: Rare X Common _____ Abundant _____ Est. # of Deer ~1-2

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1, south to north, start at Mattawamkeag River

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	0 deg. T	S3B	none	adjacent to river, hemlock stand
yes	2	0 deg. T	SH3B	none	PFO, cedar, fir, yellow birch
yes	3	0 deg. T	HS2C	none	early successional
yes	4	0 deg. T	S2B	none	cedar, red spruce, balsam fir PFO
yes	5	0 deg. T	S2/3B	none	cedar, hemlok PFO
yes	6	0 deg. T	S3B	none	cedar, hemlok PFO
yes	7	0 deg. T	S3B	Tr, P, Bd	cedar, hemlok PFO, limited browse on mountain holly

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: _____

DWA #: 100068 **Town(s)** T3 R3 WELS (south) **Date:** March 10, 2010

Snow Depth: Open 12-18" Cover 12-20"

Crew: T. Tetreau **Sinking:** Open NA Cover 4-6" (old)

Were snowshoe hares: Rare _____ Common X Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches 21+ days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Start at Northwest end of transect 2, working Southeast.

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
yes	1	~135º True	S2B	none	cedar forest
yes	2	~135º True	S3A	none	mostly cedar forest
yes	3	~135º True	S3A	none	thick balsam fir understory in cedar forest
yes	4	~135º True	S3A	none	thick balsam fir understory in cedar forest, common hare sig
yes	5	~135º True	S2B	none	thick balsam fir understory in cedar forest
yes	6	~135º True	SH2B	none	
yes	7	~135º True	SH2B	none	
yes	8	~135º True	S2B	none	thick balsam fir
yes	9	~135º True	S3A	none	excellent cover in cedar forest just to north of transect
yes	10	~135º True	S2B	none	excellent cover in cedar forest just to north of transect
yes	11	~135º True	S2B	none	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100198 **Town(s)** Woodville **Date:** 3/20/09

Snow Depth: Open 30+ Cover 30+

Crew: T. Tetreau, S. Duigan, C. Ferris, M. Arsenault **Sinking:** Open _____ Cover _____

Were snowshoe hares: Rare _____ Common _____ Abundant X Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 1, start at access road, head northerly to edge of DWA

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1(350)	10 deg T	S1B	none	just off road, spruce-fir regen
Y	2(351)	10 deg T	S1B	none	spruce-fir regen
Y	3(352)	10 deg T	S1B	none	spruce-fir regen
Y	4(353)	10 deg T	S1B	none	spruce-fir regen
Y	5(354)	10 deg T	S1B	none	spruce-fir regen
Y	6(355)	10 deg T	S1C	none	spruce-fir regen
Y	7(356)	10 deg T	S1C	none	spruce-fir regen
Y	8(357)	10 deg T	SH1C	none	
Y	9(358)	10 deg T	S1B	none	spruce-fir regen
Y	10(359)	10 deg T	S1C	none	spruce-fir regen
Y	11(360)	10 deg T	S1C	none	spruce-fir regen
Y	12(361)	10 deg T	S2C	none	cedar stand
Y	13(362)	10 deg T	S2C	none	cedar stand
Y	14(363)	10 deg T	S2C	none	cedar stand
Y	15(364)	10 deg T	S2C	none	cedar stand
Y	16(365)	10 deg T	S1C	none	spruce-fir regen
Y	17(366)	10 deg T	S1C	none	spruce-fir regen
Y	18(367)	10 deg T	S1C	none	spruce-fir regen

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100198 **Town(s)** Woodville **Date:** 3/20/09

Snow Depth: Open 30+ Cover 30+

Crew: T. Tetreau, S. Duigan, C. Ferris, M. Arsenault **Sinking:** Open _____ Cover _____

Were snowshoe hares: Rare _____ Common _____ Abundant X Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 3, Chain 273, start at access road and head northerly to edge of DWA

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1(273)	10 deg T	SH1C	none	
Y	2(274)	10 deg T	S1C	none	spruce-fir regen
Y	3(275)	10 deg T	S1C	none	spruce-fir regen
Y	4(276)	10 deg T	SH2B	none	large hemlocks
Y	5(277)	10 deg T	S1C	none	early successional
Y	6(278)	10 deg T	PSS/PEM	none	open beaver bog area
Y	7(279)	10 deg T	PSS/PEM	none	open beaver bog area
Y	8(280)	10 deg T	SH1C	none	alder swamp with stream
Y	9(281)	10 deg T	S2B	none	
Y	10(282)	10 deg T	SH1C	none	
Y	11(283)	10 deg T	SH1C	none	
Y	12(284)	10 deg T	S2C	none	
Y	13(285)	10 deg T	SH2C	none	
Y	14(286)	10 deg T	SH2C	none	
Y	15(287)	10 deg T	SH1C	none	
Y	16(288)	10 deg T	S1C	none	spruce-fir regen
Y	17(289)	10 deg T	S1C	none	spruce-fir regen
Y	18(290)	10 deg T	S1C	none	spruce-fir regen
Y	19(291)	10 deg T	S1C	none	spruce-fir regen
Y	20(292)	10 deg T	S1B	none	spruce-fir regen
Y	21(293)	10 deg T	SH2B	none	large hemlocks and maples
Y	22(294)	10 deg T	SH2B	none	large hemlocks and maples

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100198 **Town(s):** Woodville **Date:** 3/20/09

Crew: C. Ferris, M. Arsenault, T. Tetreau, S. Duigan

Snow Deptl Open 30" Cover 30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare ____ Common X Abundant ____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes ____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd ____
WSI>60 ____

Starting Point(s): Transect #4 is west of the existing T-line and south of the access road used to enter the area

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	190 deg T	SH 2 C	None	near access road
Y	2	190 deg T	HS 2 C	None	
Y	3	190 deg T	HS 2 C	None	
Y	4	190 deg T	SH 2 B	None	
Y	5	190 deg T	SH 2 C	None	
Y	6	190 deg T	SH 1 C	None	Spurce-larch-cedar swamp
Y	7	190 deg T	SH 1 C	None	
Y	8	190 deg T	SH 1 C	None	
Y	9	190 deg T	S 1 C	None	
Y	10	190 deg T	S 2 C	None	
Y	11	190 deg T	S 2 C	None	
Y	12	190 deg T	S 2 C	None	
Y	13	190 deg T	S 2 C	None	
Y	14	190 deg T	S 2 C	None	
Y	15	190 deg T	S 2 B	None	
Y	16	190 deg T	SH 2 C	None	
Y	17	190 deg T	SH 1 C	None	
Y	18	190 deg T	SH 1 C	None	
Y	19	190 deg T	SH 2 C	None	
Y	20	190 deg T	SH 2 C	None	
Y	21	190 deg T	SH 2 B	None	
Y	22	190 deg T	SH 2 C	None	
Y	23	190 deg T	SH 2 C	None	
Y	24	190 deg T	SH 2 C	None	
Y	25	190 deg T	SH 2 C	None	
Y	26	190 deg T	SH 2 C	None	
Y	27	190 deg T	SH 2 C	None	
Y	28	190 deg T	S 1 C	None	
Y	29	190 deg T	S 1 C	None	
Y	30	190 deg T	S 1 C	None	
Y	31	190 deg T	S 2 C	None	

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	32	190 deg T	S 2 C	None	
Y	33	190 deg T	S 2 C	None	
Y	34	190 deg T	S 2 C	None	
Y	35	190 deg T	S 2 C	None	
Y	36	190 deg T	SH 1 C	None	
Y	37	190 deg T	HS 1 C	None	
Y	38	190 deg T	S 1 C	None	
Y	39	190 deg T	HS 1 B	None	
Y	40	190 deg T	HS 2 C	None	
Y	41	190 deg T	HS 2 C	None	
Y	42	190 deg T	S 2 C	None	
Y	43	190 deg T	S 2 C	None	
Y	44	190 deg T	SH 2 C	None	
Y	45	190 deg T	H 2 B	None	
Y	46	190 deg T	HS 2 C	None	
Y	47	190 deg T	HS 2 C	None	

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100198 **Town(s)** Woodville

Snow Depth: Open 30+" Cover

Crew: M. Arsenault, T. Tetreau, C. Ferris, S. Duigan **Sinking:** Open 6-8" Cover
tracks have settled

Were snowshoe hares: Rare Common X Abundant Est. # of Deer 1-2

Bobcat signs (tracks, kills) observed? Yes No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd
WSI>60

Starting Point(s): Transect 5, start at logging road and work south to Butterfield Ridge road, 190º

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	190º T	SH2C	none	snowshoe hare present, residual Thu occ, Tsu can, Abi bal
Y	2	190º T	S3B	none	small residual patch og Tsu can
Y	3	190º T	SH2C	none	regen
Y	4	190º T	S1C	none	open wetland with Abi bal, Thu occ
Y	5	190º T	S1C	none	open wetland with Abi bal, Thu occ, Pin str
Y	6	190º T	S1C	none	snowshoe hare abundant, regen - Pic rub, Pin str, Abi bal
Y	7	190º T	S1C	none	snowshow hare common, dense regen
Y	8	190º T	SH1C	none	early successional - Bet pop saplings
Y	9	190º T	S1C	none	early successional
Y	10	190º T	S1C	none	regen clearcut
Y	11	190º T	not forested	none	regen clearcut, few residual trees - Thu occ
Y	12	190º T	not forested	none	regen clearcut with residual trees
Y	13	190º T	not forested	none	regen clearcut
Y	14	190º T	S1C	none	regen clearcut - residual Pin str
Y	15	190º T	S1C	none	regen softwood
Y	16	190º T	S1C	none	regen
Y	17	190º T	S1C	none	open wetland with standing dead Thu occ
Y	18	190º T	S1C	none	open wetland with standing dead Thu occ
Y	19	190º T	S1C	none	open spruce bog
Y	20	190º T	S1/2C	none	spruce bog
Y	21	190º T	S1C	none	spruce bog
Y	22	190º T	S1/2C	none	spruce bog
Y	23	190º T	S2C	none	spruce bog
Y	24	190º T	S2C	none	PFO - Thu occ transition
Y	25	190º T	S2C	Tr, P	old activity, tracks have settled, 1 pellet cluster, Thu C
Y	26	190º T	S2C	none	Thu occ wetland
Y	27	190º T	S2C	none	Thu occ woodland
Y	28	190º T	S2C	none	historic browse on regen
Y	29	190º T	S2C	none	edge of open clearcut
Y	30	190º T	S2C	none	historic browse on Ace rub, Bet all saplings

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	31	190º T	not forested	none	historic browse on Ace rub saplings
Y	32	190º T	S2C	none	regen clearcut, historic broswe on Ace rub shrubs and
Y	33	190º T	S3C	none	residual Thu occ patches
Y	34	190º T	S2C	none	historic browse on Ace rub saplings
Y	35	190º T	S2C	none	historic browse on Ace rub saplings
Y	36	190º T	S1C	none	residual Thu occ
Y	37	190º T	S2C	none	residual Thu occ, historic browse on Ace rub
Y	38	190º T	SH1C	none	early successional with Abi bal, Bet pop
Y	39	190º T	HS1C	none	early successional, historic broswe on Ace Rub
Y	40	190º T	HS1C	none	open with regen, historic browse
Y	41	190º T	HS1C	none	historic browse on Ace rub
Y	42	190º T	HS1C	none	historic browse
Y	43	190º T	HS1C	none	historic browse
Y	44	190º T	SH1C	none	historic browse
Y	45	190º T	S2C	none	historic browse - Ace rub
Y	46	190º T	S2C	none	historic browse, residual Thu occ
Y	47	190º T	S2C	none	historic browse
Y	48	190º T	S2C	none	historic browse, residual Thu occ
Y	49	190º T	HS1C	none	historic browse, regen clearcut
Y	50	190º T	HS1C	none	early successional
Y	51	190º T	HS1C	none	early successional, snowshoe hare common
Y	52	190º T	HS1C	none	early successional
Y	53	190º T	HS1C	none	early successional, historic browse
Y	54	190º T	HS1C	none	regen clearcut, historic browse
Y	55	190º T	HS1C	none	early successional with Bet pop dominant
Y	56	190º T	HS1C	none	early successional
Y	57	190º T	HS1C	none	early successional
Y	58	190º T	HS1C	none	early successional
Y	59	190º T	HS1C	none	early successional
Y	60	190º T	HS1C	none	early successional, Tsu can regen
Y	61	190º T	HS1C	none	early successional, recent harvests
Y	62	190º T	HS1C	none	early successional, Bet all and Bet pop regen
Y	63	190º T	H1C	none	early successional
Y	64	190º T	H1C	none	thick Bet all, Ace rub saplings
Y	65	190º T	SH2C	none	residual Tsu can
Y	66	190º T	SH2C	none	residual Tsu can
Y	67	190º T	H1C	none	early successional Bet pop, Ace rub
Y	68	190º T	HS1C	none	early successional
Y	69	190º T	SH2C	none	early successional, residual Tsu can
Y	70	190º T	SH2C	none	residual Tsu can
Y	71	190º T	SH1C	none	Abi bal regen
Y	72	190º T	SH2C	none	residual Tsu can, snowshoe hare present
Y	73	190º T	HS1C	none	early successional
Y	74	190º T	HS1C	none	early successional, snowshoe hare present
Y	75	190º T	H1C	none	early successional - Ace rub, fagus gra
Y	76	190º T	H1C	none	young fagus gra stand
Y	77	190º T	H1C	none	young fagus gra stand
Y	78	190º T	H1C	none	early successional
Y	79	190º T	HS2C	none	residual Tsu can, fagus gra, Bet all
Y	80	190º T	HS2C	none	residual Tsu can, Ace sac, Bet all
Y	81	190º T	HS2C	Tr	tracks - settled in snow, no recent activity
Y	82(29)	190º T	SH2C	none	
Y	83(28)	190º T	SH2C	none	
Y	84(27)	190º T	SH2C	none	
Y	85(26)	190º T	SH2C	none	
Y	86(25)	190º T	SH2B	none	
Y	87(24)	190º T	HS2C	none	
Y	88(23)	190º T	HS2C	none	

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	89(22)	190º T	HS2C	none	
Y	90(21)	190º T	HS2C	none	
Y	91(20)	190º T	HS2C	none	
Y	92(19)	190º T	HS1C	none	
Y	93(18)	190º T	HS1C	none	

Comments:

Transect passes through 2nd growth and early succssional forest; skid trails common; small cedar wetlands and spruce bogs are present along transect; canopy open, poor DWA cover throughout transect; dense understory of Abi bal, bet pop, Bet all, Pop tre in many areas

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100198 **Town(s)** Woodville **Date:** 3/20/09

Snow Depth: Open 30+" Cover _____

Crew: S. Duigan, T. Tetreau, C. Ferris, M. Arsenault **Sinking:** Open 6-8" Cover _____

Were snowshoe hares: Rare _____ Common X Abundant _____ Est. # of Deer 0

Bobcat signs (tracks, kills) observed? Yes _____ No X

Date last snow > 2 inches >10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd _____
WSI>60 _____

Starting Point(s): Transect 6, Chain 272, North to South; start at access road and work towards Butterfield Ridge Rd

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1(272)	190 deg T	S1B	none	Thu Occ, Abi bal
Y	2(271)	190 deg T	S1B	none	Thu Occ, Abi bal
Y	3(270)	190 deg T	S1B	none	Thu Occ, Abi bal, Tsu can
Y	4(269)	190 deg T	S1B	none	Abi bal, scattered emerging Pin str
Y	5(268)	190 deg T	S1A	none	Abi bal, Thu occ
Y	6(267)	190 deg T	S1A	none	Abi bal, Thu occ, Pic rub
Y	7(266)	190 deg T	S1A	none	Abi bal, Thu occ, Pic rub, plot at road edge
Y	8(265)	190 deg T	S1B	none	Pic rub, Thu occ, Pin str
Y	9(264)	190 deg T	S1A	none	Pic rub, Thu occ, Pin str, Lar lar
Y	10(263)	190 deg T	S1C	none	regen clearcut
Y	11(262)	190 deg T	S1B	none	"B" due to old trails
Y	12(261)	190 deg T	S1B	none	Abi bal, Pic rub, Thu occ
Y	13(260)	190 deg T	S1A	none	thick regen
Y	14(259)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	15(258)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	16(257)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	17(256)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	18(255)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	19(254)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	20(253)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	21(252)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	22(251)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	23(250)	190 deg T	S1A	none	thick regen, with 12' wide trails every 75'
Y	24(249)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	25(248)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	26(247)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	27(246)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	28(245)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	29(244)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	30(243)	190 deg T	PEM	none	open bog, was once a cedar swamp

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	31(242)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	32(241)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	33(240)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	34(239)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	35(238)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	36(237)	190 deg T	PEM	none	open bog, was once a cedar swamp
Y	37(236)	190 deg T	S1A	none	tight spruce-fir regen, skid trails every 50'
Y	38(235)	190 deg T	SH1C	none	moose browse
Y	39(234)	190 deg T	SH1C	none	
Y	40(233)	190 deg T	SH1C	none	
Y	41(232)	190 deg T	SH1C	none	
Y	42(231)	190 deg T	S1C	none	becomes softwood
Y	43(230)	190 deg T	S1C	none	
Y	44(229)	190 deg T	S1B	none	Thu occ, Tsu can over spruce-fir regen
Y	45(228)	190 deg T	SH1C	none	Abi bal, Thu occ, emerging
Y	46(227)	190 deg T	SH1C	none	clear cut
Y	47(226)	190 deg T	SH1C	none	clear cut
Y	48(225)	190 deg T	SH1C	none	clear cut
Y	49(224)	190 deg T	SH1C	none	clear cut
Y	50(223)	190 deg T	SH1B	none	
Y	51(222)	190 deg T	SH1B	none	
Y	52(221)	190 deg T	SH1B	none	
Y	53(220)	190 deg T	S1B	none	
Y	54(219)	190 deg T	S1B	none	
Y	55(218)	190 deg T	S1B	none	Thu occ, Abi bal - 20' tall
Y	56(217)	190 deg T	S1B	none	
Y	57(216)	190 deg T	S1B	none	
Y	58(215)	190 deg T	S1B	none	
Y	59(214)	190 deg T	S1A	none	tight mixed regen with skid trails
Y	60(213)	190 deg T	S1A	none	tight mixed regen with skid trails
Y	61(212)	190 deg T	S2B	none	Thu occ, Tsu can, thick understory - Abi bal
Y	62(211)	190 deg T	S2B	none	Thu occ, Tsu can, thick understory - Abi bal
Y	63(210)	190 deg T	HS1B	none	cut area, skid trails every 50'
Y	64(209)	190 deg T	S1A	none	cut area, skid trails every 50'
Y	65(208)	190 deg T	H1C	none	cut area, skid trails every 50'
Y	66(207)	190 deg T	H1C	none	cut area, skid trails every 50'
Y	67(206)	190 deg T	H1C	none	cut area, skid trails every 50'
Y	68(205)	190 deg T	H1C	none	cut area, skid trails every 50'
Y	69(204)	190 deg T	H1C	none	cut area, skid trails every 50'
Y	70(203)	190 deg T	H1C	none	cut area, skid trails every 50'
Y	71(202)	190 deg T	HS1B	none	Bet pop, Ace rub, Bet all, Tsu can, Abi bal
Y	72(201)	190 deg T	HS1B	none	Bet pop, Ace rub, Bet all, Tsu can, Abi bal
Y	73(200)	190 deg T	HS1B	none	Bet pop, Ace rub, Bet all, Tsu can, Abi bal
Y	74(199)	190 deg T	S1A	none	Pic rub, abundant hare sign
Y	75(198)	190 deg T	S1A	none	Pic rub, abundant hare sign
Y	76(197)	190 deg T	S1A	none	Pic rub, abundant hare sign
Y	77(196)	190 deg T	S1A	none	Pic rub, abundant hare sign
Y	78(195)	190 deg T	S1A	none	Pic rub, abundant hare sign
Y	79(194)	190 deg T	S1B	none	Pic rub, Abi bal, Tsu can
Y	80(193)	190 deg T	S1A	none	Pic rub, Abi bal, Tsu can
Y	81(192)	190 deg T	S1B	none	Ace rub, Bet pop, Bet all, Fag gra
Y	82(191)	190 deg T	S1B	none	Ace rub, Bet pop, Bet all, Fag gra
Y	83(190)	190 deg T	H2B	none	Tsu can, Fra ame, Bet pop, Bet all, Ace rub, Ace sac
Y	84(189)	190 deg T	H2B	none	Tsu can, Fra ame, Bet pop, Bet all, Ace rub, Ace sac
Y	85(188)	190 deg T	H2B	none	Tsu can, Fra ame, Bet pop, Bet all, Ace rub, Ace sac
Y	86(187)	190 deg T	H2B	none	Tsu can, Fra ame, Bet pop, Bet all, Ace rub, Ace sac
Y	87(186)	190 deg T	H2B	none	Tsu can, Fra ame, Bet pop, Bet all, Ace rub, Ace sac
Y	88(185)	190 deg T	SH2B	none	Bet pap, Tsu can, Thu occ, Ace rub

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	89(184)	190 deg T	SH2B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	90(183)	190 deg T	SH2B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	91(182)	190 deg T	SH2B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	92(181)	190 deg T	SH2B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	93(180)	190 deg T	SH2B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	94(179)	190 deg T	SH1B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	95(178)	190 deg T	SH1B	none	Bet pap, Tsu can, Thu occ, Ace rub
Y	96(177)	190 deg T	n/a	none	
Y	97(176)	190 deg T	n/a	none	
Y	98(175)	190 deg T	n/a	none	
Y	99(174)	190 deg T	n/a	none	
Y	100(173)	190 deg T	SH1C	none	crossed road

WILDLIFE DIVISION DWA WINTER GROUND SURVEY, Region: F

DWA #: 100198 **Town(s):** Woodville **Date:** 3/20/09

Crew: C. Ferris, M. Arsenault, T. Tetreau, S. Duigan

Snow Deptl Open 30" Cover 30"
Sinking: Open NA Cover NA

Were snowshoe hares: Rare X Common ____ Abundant ____ Est. # of Deer 1

Bobcat signs (tracks, kills) observed? Yes ____ No X

Date last snow > 2 inches > 10 days

LEGEND

Deer Sign	*Forest Type*	*Average Height*	*Crown Closure*
Br=current browsing	S=75% conifers	1=0 to 34 ft	A=81-100%
P=pellet group	SH=50-75% conifers	2=35 to 50 ft	B=51-80%
Tr=deer tracks	H=75%+ hardwood	3=50+ ft	C=0-50%
Tl=deer trails	HS=50-75% hardwood		
Bd=deer beds			

Ent'd ____
WSI>60 ____

Starting Point(s): Transect #7 is the southern transect on the west side of the T-line

In DWA?	Chains	Bearing T/M?	Forest Type	Deer Sign	Remarks
Y	1	190 deg T	H 2 C	None	
Y	2	190 deg T	HS 2 C	None	
Y	3	190 deg T	HS 2 C	None	
Y	4	190 deg T	SH 2 C	None	
Y	5	190 deg T	S 2 B	Tr	northern white cedar swamp
Y	6	190 deg T	S 1 B	None	
Y	7	190 deg T	S 1 B	None	
Y	8	190 deg T	S 1 B	Tr	
Y	9	190 deg T	S 2 B	None	
Y	10	190 deg T	H 2 B	None	
Y	11	190 deg T	HS 2 C	None	
Y	12	190 deg T	HS 2 C	None	
Y	13	190 deg T	HS 2 C	None	

Appendix 7-6
Mitigation and Compensation Report

1.0 PROJECT OVERVIEW

This compensation plan is offered as wetland and habitat compensation for two amendments to the previously permitted Oakfield Wind Project. First, in this amendment application, Maine GenLead, LLC (Maine GenLead) is proposing to construct an electrical generation lead line and the associated corridor in the organized and unorganized towns of Chester, Woodville, Mattawamkeag, Molunkus Township, Macwahoc Plantation, North Yarmouth Academy Grant Township, Reed Plantation, Glenwood Plantation, T3R3 WELS, T4R3 WELS, Linneus, and Oakfield in Penobscot and Aroostook Counties, Maine. The project is expected to consist of approximately 58.5 miles of new 115-kilovolt transmission line and access roads running from Oakfield to Chester. It is designed to serve the electrical transmission needs of the amended Oakfield wind project. Approximately 35 miles of this new transmission line is co-located with existing transmission line corridor rights-of-way (ROWs).

Second, the summit portion of the Oakfield Wind Project is being amended by Evergreen Wind Power II, LLC (Evergreen II) to change the turbine types from General Electric (GE) 1.5-megawatt (MW) turbines to Vestas V-112 3.0-MW turbines; increase the total number of turbines from 34 to 50 and the installed capacity from 51 MW to 150 MW; relocate the substation and point of electrical interconnection with the electrical grid (the Maine GenLead tie line and corridor described previously), and add up to 5 permanent meteorological towers.

2.0 PROJECT IMPACTS

The landscape surrounding most of the project corridor and summit area has been managed for commercial forestry, in some areas heavily, for the last 50 or more years. The proposed transmission corridor is adjacent to an existing ROW for at least 60 percent of its length, and the summit project takes advantage of existing roads as much as is practical.

The wetlands along the transmission corridor are comprised of small, isolated emergent wetlands, as well as large forested wetlands, both previously disturbed by timber management activity and other naturally-occurring undisturbed features. The project crosses various state and federal waterways such as the Penobscot River, Wytipitlock Stream, and small unnamed tributaries. The majority of the wetland and stream resources are not extraordinary and are typical of the large expanses of wetlands found in north-central Maine. These resources do not support a great diversity of plant species or wildlife habitats.

The environment where this project is proposed is not an unspoiled, intact landscape. The proposed impacts associated with this project are minimal, especially considering the construction practices to reduce erosion, maintain stream and vernal pool buffers, and reduce fragmentation by co-location. None of the regulated Deer Wintering Area (DWA) habitat that would be impacted by the projects is currently functioning as a DWA, nor does it contain the canopy cover that conforms to this habitat.

The proposed corridor will impact a total of 48 vernal pools, primarily due to clearing more than 25 percent of an area 250 feet around the vernal pool depression. Six pools are naturally-created pools that meet significance criteria defined by the Maine Department of Environmental Protection (MDEP), and 12 pools either contain enough egg masses to meet the significance criteria or have other biodiversity to make them a valuable resource in the landscape regardless of their origin. The project design utilizes taller poles at Significant Vernal Pools in order to span the pools without needing to remove species capable of reaching canopy height. Maine GenLead is planning to maintain wooded buffers in this 250-foot habitat area around vernal pools by increasing the height of the poles on either side of the habitat area, cutting only those trees necessary to meet safety standards to avoid contact with the transmission line.

The Maine GenLead project will result in the following wetland and habitat impacts:

- 27.4 acres of temporary wetland, permanent wetland, and stream shore habitat impact, of which:
    - 2.1 acres are permanent wetland impact from fill associated with poles and transmission line access roads;
    - 20 acres are temporary fill in the form of mats for construction vehicles, in place for less than 18 months; and
    - 5.3 acres are upland forest clearing within 100 feet of streams.
- 133 acres of secondary wetland impacts (i.e., a result of clearing and permanent community conversion) in forested wetlands; and
- 98 acres of mapped wildlife habitat in the form of Inland Wading Bird and Waterfowl Habitat (IWWH), DWA habitat, vernal pool depressions, and habitat within 250 feet of a Significant Vernal Pool.

In addition to the impacts associated with the Maine GenLead amendment, the impacts related to the construction of the summit amendment constitute an additional 12.3 acres, comprised primarily of indirect impacts associated with the clearing of upland within 100 feet of streams:

- 0.84 acre of permanent wetland fill and temporary wetland fill;
    - 0.25 acre of permanent wetland fill; and
    - 0.59 acre of temporary wetland fill in the form of mats for construction vehicles, in place for less than 18 months.
- 4.01 acres of secondary wetland impacts (i.e., a result of clearing and permanent community conversion) in forested wetlands; and
- 7.97 acres of upland clearing within 100 feet of a stream.

The 169 acres of permanent, temporary, and indirect wetland impacts, and 98 acres of MDEP regulated habitat impacts, were calculated to require compensation[1] totaling 277 acres of upland and wetland preservation, restoration, and stream buffer and significant vernal pool buffer restoration projects. Stantec Consulting (Stantec) calculated the impact numbers for each category defined in the July 2010 U.S. Army Corps of Engineers guidance document[2] and applied Best Management Practices to reduce those numbers for a utility corridor.

Maine GenLead and Evergreen II (both affiliates of First Wind, LLC) are committed to instituting effective and appropriate erosion control measures during construction, especially surrounding the temporary construction roads, including geo-textile fabric silt fence and other materials to filter out fine sediments. All soil exposed during construction will be seeded and mulched using native species seed mixes. To avoid soil compaction from using heavy machinery, operators will grade the soil. Temporary fill, i.e., mats, will be used for a limited period of time that will not exceed 18 months. All buffers will be marked on the ground prior to beginning construction using a combination of flagging and visible signage such as a 100-foot stream buffer prohibiting the use of herbicide and any refueling or maintenance of equipment. During construction, there will be no refueling or equipment maintenance within 250 feet of a Significant Vernal Pool. Any in-stream work on delineated streams will take place between July 1 and October 15 to avoid impacting fish spawning activity.

3.0 COMPENSATION

To identify an appropriate compensation package for the impacts associated with these projects, the effort included calculating an in-lieu fee amount and evaluating traditional compensation options of restoration, enhancement, and preservation. A calculation of in-lieu fee approximated $9.4 million, an

[1] Corps of Engineers July 2010 Revision of the New England District Compensatory Mitigation Guidance and Central Maine Power Company Mitigation Guidance: Adjustments to standard ratios/amounts for temporary & indirect impacts activities.
[2] Ibid.

amount prohibitive to project construction, the majority of which is a result of indirect impacts associated with transmission line construction.

Maine GenLead and Evergreen II sought a compensation plan that is a) within proximity to the impact; and b) "in-kind" as defined as being representative of those impacts incurred with the ROW development/construction. The mitigation site search also focused on identifying high value resources having contiguity with other public or conservation lands. The threat of development also played a significant role in site selection. Rather than seek out several postage-size mitigation parcels, Maine GenLead selected parcels of sufficient size and quality that would maintain a functional ecosystem and provide opportunities for restoration. This search, for example, identified several smaller parcels scattered across the landscape, each of which contained some portion of the habitats and resources required for compensation. None of these parcels, however, were contiguous with the other wildlife or wetland habitats, or were adjacent to lands already protected. Additionally, the smaller parcels were in multiple ownerships, making it difficult to obtain title and thus establish mitigation of sufficient size and quality.

As a result of the site selection process, Maine GenLead identified two parcels meeting the primary criteria:

- a 979-acre parcel in Macwahoc Plantation, centrally located along the proposed transmission corridor in Aroostook County; and
- a 2,100-acre parcel approximately 8 miles from the proposed corridor in Drew's Plantation in Penobscot County.

A more detailed investigation of the parcels identified both as rich and complex compensation opportunities. Conversations with the resource agencies indicated receptiveness to protecting the parcel in Drew's Plantation and incorporating it into an existing Wildlife Management Area.

This proposed compensation area is directly adjacent on the eastern-most side to the existing Mattawamkeag River Wildlife Management Area (WMA) managed by the Maine Department of Inland Fisheries and Wildlife (MDIFW). The southeastern border is comprised of the railroad Eastern Maine Railway (subsidiary of J.D. Irving). The southwestern border is the forest land owned and managed for timber harvest by H.C. Haynes, and the northern border is the Aroostook County line with forest land in Reed Plantation.

The proposed compensation area contains 277 acres of rare and exemplary habitat along Meadow Brook. This habitat is an unpatterned fen ecosystem that receives upwelling groundwater that contains nutrients. This provides habitat for many of Maine's rare plants, and there are two known rare plant locations in the vicinity of this parcel. A more detailed survey would likely locate more occurrences.

The compensation parcel also contains 253 acres of Land Use Regulation Commission-regulated DWA that in the last 20 years (possibly as recently as 2009) has undergone cutting activity that is part of a forest management strategy. Additionally, the parcel contains 204 acres of forested wetland, portions of which are part of the DWA. These forested wetlands have been harvested.

The scrub-shrub and emergent wetlands within the parcel are prolific, occurring primarily along the U.S. Geological Survey (USGS)-mapped streams. The compensation area contains at least four potential vernal pools. These pools were identified based on National Wetlands Inventory (NWI) wetland maps and rudimentary aerial image interpretation. Based on experience in this type of ecosystem, a full parcel survey likely will reveal more vernal pools.

This compensation area is at risk of development due to its potential for future timber harvest; the DWA habitat is particularly vulnerable. An additional parcel that MDIFW is seeking to acquire on the south side of the railroad tracks was part of a plan to subdivide and sell 10 acres to another landowner nearby. Because of the seasonal logging roads and landings, it is a realistic possibility that a similar subdivision plan is underway for this parcel as well.

This proposed 2,100 acre compensation area in Drew's Plantation provides the following compensation values:

- Adjacent to the MDIFW Mattawamkeag River WMA;
- 459 acres of wetland preservation comprised of:
    - approximately 216 acres of scrub-shrub wetland,
    - approximately 39 acres of emergent or open water wetland, and
    - approximately 204 acres of forested wetland.
- 425 acres of mapped IWWH wetland and upland buffer habitat;
- 253 acres of regulated DWA habitat;
- at least 4 potential vernal pools;
- over 15,000 linear feet of mapped USGS stream habitat in the critical habitat area for the GOM Atlantic Salmon;
- Brook trout (*Salvenius fontinalis*) habitat in the mapped perennial streams; and
- 277 acres of Rare and Exemplary habitat along Meadow Brook and two other unnamed USGS streams, an Unpatterned Fen Ecosystem.

Table 1 details the resources provided in this compensation package that meet the requirements established in the impact calculations.

3.1 COMPENSATION AREA VALUES

3.1.1 RESTORATION: WETLAND AND BUFFERS

The summit portion of the proposed project involves construction in areas with historic access roads for homesteads, camps, recreational trails, and logging activity. In some areas, these roads were re-routed to avoid impacting high-value habitats, streams, and the associated buffers. In these areas, there is opportunity to restore that portion of the habitat or wetland to its original, undisturbed condition. This process will involve removing the road bed, using the gravel material elsewhere in the project, and grading the area to match to the adjacent topography; re-vegetating using a native seed mix to avoid soil erosion; and otherwise allowing trees and shrubs to migrate and re-integrate naturally. This opportunity exists for approximately 10,000 square feet (sq. ft.) of Significant Vernal Pool buffer restoration, approximately 20,000 sq. ft. of upland stream buffer restoration, and approximately 1,800 sq. ft. of wetland restoration.

3.1.2 PRESERVATION: WETLANDS

The wetlands that would be protected in the compensation area total 459 acres, including approximately 216 acres of scrub-shrub wetland, 39 acres of open water and emergent wetland, and approximately 204 acres of forested wetland. Many of the forested wetlands in this area have been harvested in the last 20 years (perhaps as recently as 2009); existing roads make this parcel at risk for subdivision and future harvest. Scrub-shrub wetlands are the dominant wetland type in this compensation parcel according to National Wetlands Inventory maps. Scrub-shrub wetlands are valuable habitat for a variety of birds, mammals, reptiles, and amphibians, different than what may be found in a forested wetland. The emergent wetlands within the compensation area are primarily associated with the USGS streams and IWWH and are discussed in the following section. Some small pockets of emergent wetland occur elsewhere, typically associated with another wetland type as a percentage of a forested or scrub-shrub wetland complex.

This compensation area provides a valuable and complex mosaic of wetland and associated upland habitats across the 2,100 acres.

3.1.3 PRESERVATION: WILDLIFE HABITAT

Stantec's 2009 and 2010 field surveys indicate that the mapped and regulated DWAs that will be impacted along the proposed Maine GenLead transmission line corridor are not presently functioning as DWAs. There are no DWA impacts in the summit area. Past and present timber management activity removes the suitable softwood shelter stands and fragments the travel corridors. The two regulated DWAs in the compensation area have been harvested. Based on aerial photo interpretation, they do not contain conforming cover sufficient to support a wintering deer herd. Preserving these two mapped resources is a major focus of this compensation area, as is regenerating the forest canopy and prohibiting future harvest activity that is not specifically part of a DWA forest management plan.

In addition, the compensation area contains approximately three miles of perennial stream habitat, and two of the three mapped streams are direct tributaries of the Mattawamkeag River. The Mattawamkeag River is part of the critical habitat area for the GOM Atlantic Salmon and is also an existing brook trout fishery. According to the MDIFW Strategic Management Plan for brook trout,[3] the species survives best in waters below 68 degrees Fahrenheit. Protecting the canopy over tributary streams prevents the water from warming before it flows into larger streams. This practice retains the cold water river habitat required by brook trout. Brook trout are opportunistic sight feeders and are sensitive to even moderate amounts of turbidity in the water. With pressure across the state for development, it is important to preserve the wildlife habitat that is the framework for Maine outdoor sporting tourism.

Finally, this parcel includes 425 acres of mapped IWWH, of which 39 acres are open water and emergent wetland habitat. This habitat is associated with the convergence of Meadow Brook and another unnamed USGS stream and the wetland floodplain of an unnamed USGS stream before emptying into the Mattawamkeag River. These IWWHs are mapped as moderate value.

3.1.4 ADJACENT USES

This compensation area is adjacent to the 4,043-acre MDIFW Mattawamkeag River WMA. This WMA is part of the Mattawamkeag River Bogs and Fens Focus Area mapped by Beginning With Habitat. Surveys by the Maine Natural Areas Program indicate that this system is part of the largest unpatterned fen ecosystem currently mapped in the state, it contains two rare plant populations, and it is listed as an exemplary habitat. This WMA is managed for a variety of recreational uses, including fishing, boating, canoeing, and wildlife viewing. The MDIFW, in conjunction with The Nature Conservancy and the Maine Department of Transportation, is in the process of acquiring a 1,200-acre parcel on the south side of the railroad corridor, which will increase the WMA to 6,400 acres. It is anticipated that the compensation area would be deeded to the State of Maine to further expand the protected tract of land important to wildlife corridors and to protect the piece from potential development and timber harvest activity in this region.

4.0 SUMMARY

This parcel represents approximately seven times the calculated compensation acreage required for the impacts of the Maine GenLead and Evergreen II projects. The combination of diverse attributes found on this parcel---its location, continuity, resources, habitat, and threat of development—make this compensation proposal a prize for habitat and wetland restoration, land preservation, and public protection.

[3] Bonney, F.R. 2009 "Brook Trout Management Plan" Department of Inland Fisheries and Wildlife, Divisions of Fisheries and Planning. Accessed on February 2, 2011 at: [http://www.maine.gov/ifw/fishing/species/management_plans]

Table 1. Impact Extents, Ratios and Reductions Used to Determine Compensation Required and Provided for Evergreen and Maine GenLead Projects

Impacts			USACE Compensation Required (using standard USACE ratios and adjustment)[1] (in acres)	MDEP Compensation Required (using standard MDEP ratios and adjustment)[1] (in acres)	Standard Ratios and Reductions Used	Compensation Provided**	
Activity		Impact Extent (in acres)					
Temporary (< 18 mo) Wetland fill from Construction Access Roads	Temporary (< 18 mo) fill in non-forested wetlands from construction access roads	3.27	2.45	not required	15:1 to 5%	Approximately 216 acres of scrub-shrub and unconsolidated bottom wetland	
	Temporary (<18 mos.) fill in forested wetlands from construction access roads	17.32	38.97	not required	15:1 to 15%		
	Total Temporary Fill Impacts	**20.59**	**41.42**	**0.00**			
Permanent Cover Type Conversion of Forested Wetlands to Scrub/Shrub		**137.4**	**61.83**	**not required**	3:1 to 15%	204 acres of PFO preserved	1,800 square feet of wetland restoration
Permanent Cover Type Conversion in High and Moderate Value Inland Wading Bird and Waterfowl Habitat (61% of impacts are to WWH rated moderate value)		**39.03**	**not required**	**64.40**	5:1 to 33%	425 acres of IWWH habitat	
Permanent Cover Type Conversion in High and Moderate Value Deer Wintering Area Habitat (DWAs impacted are rated indeterminate value)		**42.89**	**not required**	**70.77**	5:1 to 33%	253 acres of DWA habitat protected, raised pole height in Macwahoc Co-op DWA to reduce clearing impacts	
Permanent Cover Type Conversion in Vernal Pool Habitats (250 feet)[3]		**0.93**	**0.56**	**0.09**	3:1 to 20%; 1:1 to 10%	957 acres of upland habitat under silvicultural prescription. Approximately 10,000 square feet of VP habitat buffer restoration	4 potential vernal pools identified based on NWI map interpretation.
Permanent Wetland Fill	Permanent Fill associated with Pole Locations	0.12	1.95	1.04	15:1 at 100%; 8:1 at 100%	277 acres of rare and exemplary habitat with 39 acres of emergent wetland preservation	
	Permanent Fill associated with Transmission Line Access Roads	1.59	27.89	14.80			
	Permanent Fill associated with Summit Turbine Pads and Access Roads	0.25	3.75	2.00			
	Total Permanent Fill Impacts	**1.96**	**33.59**	**17.84**			
Stream Impacts (Clearing upland within 100')		**13.31**	**3.99**	**0.67**	3:1 to 10%; 1:1 to 5%	3 miles of wetland stream shore habitat draining into the Mattawamkeag River.	Restoration of 0.5 acres of upland stream buffer

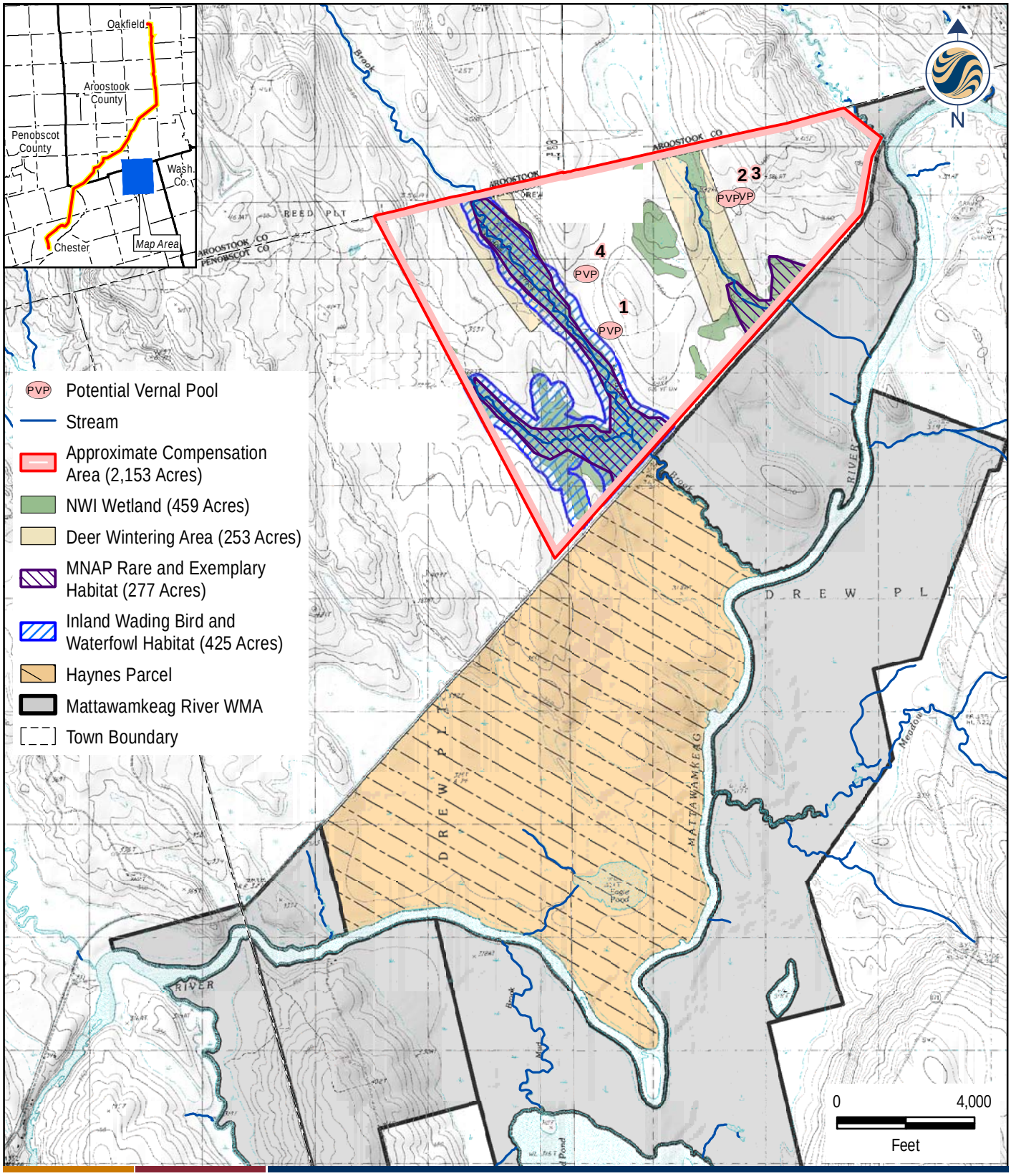
**Resources cannot be summed to find the total acres provided as compensation, there is significant resource overlap.

[1]USACE Standard Ratios: 1:1 for stream restoration, 15:1 for wetland/upland preservation, 3:1 for restoration/enhancement - also utilizing the document *CMP Mitigation Guidance: Adjustments to standard ratios/amounts for temporary & indirect impacts activities*

MDEP Standard Ratios: 1:1 for stream restoration, 8:1 for wetland/upland preservation, 1:1 for restoration/enhancement - also utilizing the document *CMP Mitigation Guidance: Adjustments to standard ratios/amounts for temporary & indirect impacts activities*

[3]Includes MDEP Significant Vernal Pools and Man-Made Vernal Pools under USACE jurisdiction which meet the MDEP Significance criteria

Figure 1
Transmission Line Compensation Area



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Client/Project
Oakfield 115kv Transmission Line
Oakfield, Maine

Figure No.
1

Title
Transmission Line Compensation Area
May 2011