

**Canada Lynx Habitat  
Assessment and 2014  
Winter Track Surveys,  
Number Nine Wind Farm**

Aroostook County, Maine



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## **Executive Summary**

EDP Renewables (EDPR) contracted Stantec Consulting Services Inc. (Stantec) to assess the potential presence of Canada lynx (*Lynx canadensis*; lynx) for the proposed Number Nine Wind Farm (Project) located in Aroostook County, Maine (Figure 1). The proposed turbine locations and portions of the proposed generator lead are located within the Canada lynx Critical Habitat and/or within the Maine "Review Area", as designated by United States Fish and Wildlife Service (USFWS). Methods used for the survey include a desktop habitat assessment and field verification, and lynx snow track surveys. The scope of work and methodology described in this report were developed, discussed with, and approved by the Maine Department of Inland Fisheries and Wildlife (MDIFW) and USFWS, and followed MDIFW's Western Mountains Eco-Regional Lynx Track Protocol.

### **Habitat Assessment**

Stantec used aerial photography and Geographic Information System (GIS) software to identify and map potentially suitable snowshoe hare (*Lepus americanus*) and lynx habitats situated within an approximately 1-mile (1.6-km) offset of the Project's proposed turbine locations and within approximately 1,000 feet (305 m) either side of the proposed generator lead lines within USFWS-mapped Critical Habitat and Review areas. The purpose of the habitat assessment was to evaluate the extent and overall quality of potential snowshoe hare and lynx habitats in the Project vicinity. The primary assumptions are that areas supporting abundant snowshoe hare provide potential lynx foraging habitat, and in general, conifer-dominated forests provide lynx with other important habitats within their home ranges.

Based on the desktop analysis, Stantec estimates that approximately 6.4 percent (5,989 acres) of the area within approximately 1 mile of the proposed wind turbines and 10.6 percent (1,197 acres) of the area 1,000 feet either side of the generator lead contain high- and moderate-value habitats that may currently support relatively high densities of snowshoe hare. An additional 18,832 acres were identified as recent clearcuts and un-harvested conifer-dominated areas that could potentially become suitable hare habitat in the future or serve as mature coniferous or mixed forest habitats thought to be suitable for lynx denning sites. In summary, the habitat assessment suggests there are abundant potential snowshoe hare and lynx habitats (current and future) throughout the assessment area.

### **Snow Track Survey**

Stantec conducted lynx snow track surveys at the Project area and in the surrounding townships on three separate occasions between January and April, 2014. Each survey consisted of a two-day site visit and occurred on January 30 and 31, 2014, March 4 and 5, 2014, and April 1 and 2,

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2014. Survey days occurred 24–72 hours after a snowfall event, defined as enough snow to allow for accurate species identification by tracks, followed by calm winds and no precipitation.

Stantec recorded 84 Canada lynx track intercepts throughout the Project area during the 3-survey period and observed 1 lynx on the survey route in Township T9 R3 WELS. Surveyors collected Global Positioning System (GPS) locations for each lynx track intercept, including locations of individuals when a group of lynx traveled together. The majority (77) of lynx tracks were located within the survey area in Townships T8 R3 WELS and T9 R3 WELS, and seven lynx tracks were located in E Township. Surveyors collected two scat samples and submitted the samples to the U.S. Department of Agriculture Forest Service Rocky Mountain Research Station, Wildlife Genetics Lab for genetic processing. Expected results from genetic processing will include species identification, sex determination, and evidence of lynx-bobcat hybridization. Results of genetic analysis will be appended to an updated version of this report.

In addition to lynx, 12 other distinct species tracks were observed, including snowshoe hare, red squirrel (*Tamiasciurus hudsonicus*), moose (*Alces alces*), white-tailed deer (*Odocoileus virginianus*), eastern coyote (*Canis latrans*), bobcat (*Lynx rufus*), fisher (*Martes pennanti*), marten (*Martes americana*), ermine (*Mustela erminea*), red fox (*Vulpes vulpes*), river otter (*Lontra canadensis*), and ruffed grouse (*Bonasa umbellus*). The most frequent non-target species track intercepts included snowshoe hare, red squirrel, eastern coyote, and moose.

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## 1.0 INTRODUCTION

### 1.1 PROJECT BACKGROUND

EDP Renewables (EDPR) contracted Stantec Consulting Services Inc. (Stantec) to assess the potential presence of Canada lynx (*Lynx canadensis*; lynx) for the proposed Number Nine Wind Farm (Project) in Aroostook County, Maine (Figure 1). The Project consists of the Turbine Area, North Generator Lead Line (North Line), and Bridal Path Generator Lead Line (Bridal Path Line). This report describes the methods and results for the lynx habitat mapping and verification, and winter snow track surveys.

Survey methods and work plans were developed based on past experience at other wind energy projects in Maine, and through consultation with the U.S. Fish and Wildlife Service (USFWS) and the Maine Department of Inland Fisheries and Wildlife (MDIFW). Stantec met with the USFWS and MDIFW on March 5, 2014 to discuss the proposed surveys. USFWS requested habitat mapping and snow-tracking surveys because the proposed Turbine Area is located within their designated Canada lynx Critical Habitat (Figure 1). The purpose of the habitat mapping was to determine the extent of potential lynx habitat in the vicinity of the Project. The primary purpose of the snow tracking was to document potential lynx use of the area through the observation of tracks and the collection of scat or hair samples. A secondary purpose of the snow tracking was to collect information on the general habitats that lynx may be using, based on the locations of observed tracks.

### 1.2 PROJECT AREA DESCRIPTION

The Project is located within the Aroostook Hills and Lowlands Ecoregion as defined in *Maine's Comprehensive Wildlife Conservation Strategy* (MDIFW 2005). This ecoregion extends from the Maine–New Brunswick, Canada border west to a line running north-south from approximately Fort Kent to Island Falls. The vegetation is transitional between temperate northern hardwoods and boreal spruce-fir forests, and the forested habitats are generally more diverse in this ecoregion than in the western portions of Aroostook County. The Aroostook Hills and Lowlands Ecoregion is sparsely populated when compared with southern Maine, with most of the development concentrated in the narrow corridor along U.S. Route One. The Project is situated in the south-central portion of the ecoregion in an area of forested hills, ridges, and valleys dominated by active forest management lands. The average elevation where the proposed Project is approximately 300 meters (m; 984 feet [']). The climate of this ecoregion is characterized by relatively low annual precipitation and cool temperatures. Heavy snowfall prolongs the winter resulting in a relatively short growing season (McMahon 1990). In general, ridge tops within this ecoregion are dominated by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) with lower elevations supporting deciduous species such as sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), and American beech (*Fagus grandifolia*). The Turbine Area is located on a series of ridgelines that do not exceed 430 m

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(1,411') in elevation. The North Line and Bridal Path Line both traverse generally flatter terrain at lower elevations.

Historically and currently, the summits of the ridgelines and the land surrounding the Project have been actively used for commercial and industrial forest management purposes. This is evident by the predominance of past, recent, and on-going harvesting activity as well as the extensive network of haul roads. Due to forest harvesting activities, much of the forest cover within the Project is in various stages of regeneration. Ongoing management activities include the development and expansion of softwood plantations throughout the Project area.

## 1.3 SPECIES BACKGROUND

The lynx is listed as a threatened species under the U.S. Endangered Species Act of 1973 (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.). Lynx is a boreal forest species currently considered to be at the southern end of its geographic range in Maine. In Maine, lynx are more abundant in the northern part of the state where spruce budworm epidemics of the 1980s and previous large clearcutting practices resulted in large tracts of densely regenerating spruce and fir stands. In this area, lynx prefer regenerating spruce-fir habitats with high stem densities because these cover types can support high populations of snowshoe hare (*Lepus americanus*) — the lynx's preferred and primary food source (Vashon et al. 2012). Habitat that is ideal for snowshoe hare is thereby important for lynx. This type of habitat is typically found in regenerating clearcuts or partial-cuts where the tree canopy has been removed. Optimum snowshoe hare cover typically develops 10–30 years after cutting as coniferous (softwood) regeneration becomes dense enough and large enough to provide both food and cover. Dense deciduous (hardwood) and mixed softwood-hardwood regeneration can also provide suitable hare habitat. Although forested wetlands (i.e., bogs and swamps) and late-successional forests can contain dense softwood cover, literature suggests that in this region the snowshoe hare is less likely to inhabit those cover types (Hoving et al. 2004). Open areas within stands of densely regenerating conifers also have been shown to be important for lynx because lynx appear to have an easier chase and higher foraging success (Fuller and Harrison 2010). In addition, USFWS and MDIFW have indicated (Vashon, personal communication) that some more mature forests with dense softwood regeneration in the understory may be important habitat for lynx in this region because they can contain the preferred cover and food source for hare, as well as habitat features important for lynx (e.g., denning sites). USFWS further believes that conifer-dominated forests would provide an important habitat component for lynx, serving either as existing forest cover or providing future potential snowshoe hare habitats in the event that harvesting or other large-scale forest disturbance were to occur, followed by conifer regeneration.

The designated Critical Habitat for lynx generally encompasses the northern half of Maine extending to the southern end of Moosehead Lake and east to the I-95 and U.S. Route One corridors (Figure 1). The USFWS-designated lynx "Review Area" in Maine includes additional area along the eastern Maine border with New Brunswick, Canada, south to approximately the east-west running Route 6 corridor. Portions of the Project are located within the designated Critical

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Habitat, including the Turbine Area, and portions of the North Line. The remaining portions of the generator lead, including the North Line from Littleton to Houlton, and the Bridal Path from Houlton to Haynesville, are within the lynx Review Area.

## 2.0 METHODS

### 2.1 HABITAT ASSESSMENT

#### 2.1.1 Overall Methodology

Stantec used aerial photography and Geographic Information System (GIS) software to identify and map suitable snowshoe hare habitats within the Project's Canada lynx assessment areas. The assessment areas included approximately a one-mile (1.6 km) offset from the Project's proposed turbine string as well as areas within approximately 1,000 feet (305 m) either side of the proposed generator lead that includes the North Line and the Bridal Path Line (Figure 1). The total area assessed is approximately 104,339 acres (42,225 ha, or 163 square miles) that is owned and managed by a mix of smaller private, and larger commercial and industrial landowners. The primary purpose of the habitat assessment was to evaluate the extent and overall suitability of snowshoe hare habitats in the Project vicinity, assuming habitats that support abundant snowshoe hare provide potential lynx foraging habitat (Robinson 2006, Scott 2009, Simons 2009). A secondary purpose was to assess other habitat types that may be important to lynx now and in the future, including recent clearcuts that are expected to become suitable hare habitats in a decade or less, as well as mature conifer forests for denning habitat and other conifer-dominated forests that could become important lynx habitat in time or with future disturbance. The assessed area covers several townships, and as such, was considered large enough to provide a "landscape perspective."

#### 2.1.2 Aerial Photo Interpretation

To identify potential hare and lynx habitats, Stantec initially reviewed existing digital aerial photographs comprised of high-resolution (1' [30-cm] pixel size) true color, aerial imagery available from the ESRI® World Imagery web mapping service. This digital imagery, dated June 2011, was viewed on-screen in 2-D using ArcGIS® software to identify and digitize the habitat types targeted for this mapping effort. The proposed<sup>1</sup> wind turbine locations, generator lead, and offset boundaries were superimposed on the imagery to define the assessment area. In addition to the 2011 imagery, we also viewed aerial imagery from Google Earth® for the months of September 2013, November 2011, September 2007, and May 1996. These additional aerial

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<sup>1</sup> For this assessment, we used the wind turbine and generator lead centerline locations provided by EDPR, dated April 3, 2015.

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photos provided a historical perspective, and in the case of the 2013 imagery, allowed us to update the land cover changes that occurred since the 2011 World Imagery photographic data were collected.

Unlike 3-D/stereo photo interpretation, 2-D imagery does not allow the viewer to directly observe differences in tree heights, so we relied on the relative sizes of the individual trees seen on the imagery to estimate height and age, and also on the variations in the length of shadows cast by the trees. In this way, we were able to distinguish areas of regenerating forest from more mature forests. The hare habitat-value designations were based on the habitat parameters observed on the aerial photography, primarily in regard to stand type, stand age, and stand density. Stand size also was considered, given that some stands may provide suitable conditions for hare but their small size may not effectively support or sustain a viable population.

Potential snowshoe hare-lynx habitat polygons identified on the aerial imagery were initially digitized and divided into four categories based generally on the scientific literature (Robinson 2006): high-value, moderate-value, future hare habitats, and mature forests:

- *High-value* —habitat types typically preferred by snowshoe hare, which are characterized by dense stands of early-successional regenerating coniferous forest approximately 10–35 years old that can provide this species with optimal conditions for food and cover. High-value areas also included dense mixed (coniferous-deciduous) regenerating stands if the density and age class appeared to provide suitable food and cover, as these habitats may provide optimal conditions during certain times of the year. Identified high-value habitats may or may not include small openings that could provide increased lynx hunting success.
- *Moderate-value* —habitat types that likely provide suitable hare habitat, but where the stand density, age, and/or species composition do not appear to provide optimal conditions for food and cover. Moderate-value habitats include those where the stand age is approaching the upper limit (e.g., >30 years old), where the stand has not yet reached the optimal age or density, or where the stand generally does not exhibit a consistency in the quality of habitat throughout. High-value and moderate-value hare-lynx habitat polygons were later combined to comprise the *Current* habitat landcover category described above.
- *Future* —areas that may become suitable hare habitat as the vegetation matures and becomes more dense (i.e., regeneration fills in the openings). Mapped future hare-lynx habitats included recent clearcuts or thinned stands with obvious signs of young but relatively dense coniferous or mixed regeneration. In general, the future hare habitats that Stantec digitized from aerial imagery included those that would be expected to provide suitable hare habitat within 5–15 years (from the date of aerial photos). As described below, these recently-harvested areas were combined with mature forests and existing conifer forests (any age or height class) that could provide various types of lynx habitats in the future.

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- *Mature* - areas of relatively mature coniferous and coniferous-dominated mixed forests that may represent other potential habitats used by lynx and hare. Mature forest polygons that Stantec digitized from aerial imagery included areas of *relatively* mature forest, particularly conifers, that may provide cover and food for snowshoe hare, and/or travel, denning, feeding, or resting areas for lynx<sup>2</sup>. Though the understory vegetation or specific habitat features in these mature forest stands could not be discerned from the leaf-on aerial photography, we assumed that some of the mature forests have a dense understory of regenerating softwoods that could provide food and cover for hare, as well as denning sites (e.g., mature tree blowdowns) for lynx. The digitized mature forest polygons were later combined with the digitized future hare habitats (above) and the coniferous forests from the NLCD analyses to form the *Future* hare-lynx habitat category.

In a March 16, 2015, meeting attended by EDPR and Stantec, Mark McCullough (USFWS) requested that the habitat assessment methods for the Project be modified by dividing all lands in the assessment areas into four broad habitat categories: (1) Current hare-lynx habitat, (2) Future hare-lynx habitat, (3) Matrix habitat, and (4) Other/Non-forest land cover. Definitions of these categories are:

1. *Current* hare-lynx habitat – regenerating conifer stands that were initially mapped by Stantec as high- and moderate-value hare-lynx habitats (see above).
2. *Future* hare-lynx habitat – includes (a) recent clearcuts with existing or expected coniferous regeneration (initially mapped by Stantec as “future” hare habitat), (b) existing forests initially mapped as “mature forest” habitat for denning, feeding, resting, traveling, etc., and (c) other conifer-dominated forest stands that offer the potential for development of hare-lynx habitat in the future in the event of timber harvesting activities or natural large-scale disturbances (e.g., fire or disease) that could result in conifer regeneration.
3. *Matrix* habitat – all other forest types (e.g., deciduous-dominated).
4. *Other (Non-forest)* habitats – open water, emergent and shrub wetlands, agricultural fields, barren lands, and developed lands that would not typically be used by hare or lynx.

### 2.1.3 National Land Cover Database

In the March 16, 2015, meeting, USFWS had suggested using landowner cover-type data to map the Future, Matrix, and Other categories. Despite a series of efforts made by EDPR to procure landowner stand information, those data were not available. The alternatives were to map the habitats by hand using aerial photography, or to use the National Land Cover Database (NLCD). EDPR and Stantec chose to use the NLCD based on an analysis of overall accuracy of its cover mapping. The NLCD (2011) is a satellite-derived land cover mapping product available from the Multi-Resolution Land Characteristics Consortium <http://www.mrlc.gov/nlcd2011.php>. This publicly-available database divides the land cover into a 20-class landcover classification

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<sup>2</sup> Mapping of mature forests for this project was requested by Mark McCullough (USFWS) and Jennifer Vashon (MDIFW) in 2014.

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scheme across the United States at a spatial resolution of 30 meters (i.e., a 30-meter pixel size). Stantec used this cover class mapping, in conjunction with the digitized data from aerial photo interpretation of lynx-hare habitats, to aid in identifying, mapping, and quantifying at a landscape level the various habitats found the Project assessment area that may, or may not, be used by hare and lynx. The goal was to use the NLCD data to illustrate (1) areas that generally meet the definitions of *Future* and *Matrix* forest habitat categories for hare and lynx, as specified by USFWS for this Project, and (2) areas that contain non-forested cover types that are not likely to provide habitat for hare and lynx.

Stantec combined the NLCD 2011 Evergreen Forest areas with the Future and Mature habitats digitized from aerial photos to develop the *Future* category of lynx-hare habitat. Other forested areas classified by the NLCD 2011 were placed in the *Matrix* category, while the remaining cover classifications were placed in the *Other (non-forested)* category. Polygons depicting the identified habitats were color-coded and a set of maps were then produced to illustrate the four habitat categories specified by USFWS (Figures 3, 4, and 5).

Of the 16 NLCD classifications found in Maine, only Evergreen Forest was included in *Future* category. Included in the *Matrix* category were Mixed Forest, Deciduous Forest, and Woody Wetlands. The following were included in the *Other (non-forest)* category:

- Open Water
- Perennial Ice/Snow
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Scrub/Shrub
- Emergent Herbaceous Wetlands
- Pasture/Hay
- Cultivated Crops

### 2.1.4 Hare Habitat Field Verifications

Following the preliminary identification of the hare/lynx habitats on the aerial imagery, Stantec biologists conducting the snow-tracking surveys field-checked 39 of the hare habitat polygons to assess the accuracy of the aerial photo interpretation. The habitats were photographed from the ground and cursory data were collected on dominant tree species, tree height, and overall stocking density. This information was then used by the aerial photo interpreter to adjust the habitat boundaries, add or subtract polygons, and re-assign habitat categories where necessary. Snow tracking data (see Section 2.2 below) were also used, in a general sense, to correlate the mapped habitats with observed use by lynx and hare. The preliminary mapping data were updated based on the field checks.

## 2.2 SNOW TRACK SURVEYS

Stantec conducted three rounds of lynx snow track surveys from January 2014 to April 2014 (Figure 6). Lynx snow tracking surveys were conducted in accordance with the MDFIW Western

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Mountains Eco-regional Lynx Track Survey Protocol that was provided by MDIFW on February 18, 2010. Stantec and EDPR met with MDIFW and USFWS on March 5, 2014 to review the Project draft workplan, which included the lynx snow track survey protocol. On March 19, 2014, Stantec had a follow-up conversation with MDIFW biologist Jennifer Vashon to review the specifics of the lynx habitat assessment and snow track survey protocols. Stantec and EDPR received feedback on the workplan from MDIFW on March 20, 2014.

Following guidelines in the MDIFW Western Mountains Eco-regional Lynx Track Survey Protocol, Stantec completed three rounds of snow track surveys in a one-mile survey area surrounding the proposed turbine locations. Surveys occurred in areas where landowners granted access. Because snowmobiles were used, no surveys occurred on roads regularly plowed for active logging operations. During each visit, Stantec searched for lynx tracks within areas that contained high value hare habitat and areas along an established series of unplowed logging and snowmobile trails in the Project area (Figure 4). Snow track surveys covered approximately 110 miles (177 km) of roads and trails throughout the Project area during each round of survey.

Stantec remotely monitored weather conditions throughout the entire survey period via weather forecasting websites including the National Oceanic and Atmospheric Administration Operational Hydrologic Remote Sensing Center, Station 8949B\_MADIS in Presque Isle, Maine. Track surveys occurred 24–72 hours after a suitable weather event. Suitable weather included a wind event or snowfall event followed by calm weather. These conditions leave a surface that provides detailed track quality allowing for species identification. Initiating the survey 24 hours after a weather event allows for lynx movement and increases the likelihood of encountering a track during the survey. Restricting snow track surveys to within 72 hours increases the likelihood of encountering fresh tracks unaltered by wind or warm temperatures, which exhibit definitive species characteristics, allowing more accurate identification.

Each survey effort occurred over a two-day period. To allow for a more thorough survey effort, and in order to complete the survey in two days, two to three surveyors divided the Project area survey routes (Figure 4). Snow tracking began between 6:00 am and 8:30 am and continued until all possible survey routes were completed, or until low light conditions made track identification difficult. Surveyors traveled at a sufficiently slow speed that allowed for identification of all tracks encountered along the survey route.

When a lynx track was intercepted, surveyors documented habitats and suspected behavior through field notes, photographs, and track measurements. When possible, surveyors collected three sets of track measurements in a section of trail where the animal showed a direct register walk with an even, unhurried pace. Measurements included trail width (straddle), trail length (stride), track width, track length, sinking depth, and direction of travel. In addition, surveyors recorded a MDIFW's Snow Track Quality (STQ) rating, which ranges from the highest quality rating of four, where every footprint leaves a clear track to the poorest quality rating of zero where gait (i.e., walking) pattern is difficult to determine. Surveyors also noted evidence of incidental species (non-target species), but counts and locations were not recorded due to limited time.

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When time allowed, surveyors followed lynx tracks forward and back along their trail to search for scat or hair samples for genetic processing. Surveyors documented each sample with a GPS point and photographs then collected the sample using a sterile container. Each sample was labeled with the date, GPS location, and a unique lynx track identification (ID). The scat was prepared following protocols from the United States Department of Agriculture (USDA) Forest Service Rocky Mountain Research Station, Wildlife Genetics Lab and sent to the lab for genetic processing. Genetic processing includes species confirmation, a test for hybridization with bobcat, and sex determination.

## 3.0 RESULTS

### 3.1 HABITAT ASSESSMENT

#### 3.1.1 Remote Sensing

Analysis of aerial imagery of the Project area documented relatively abundant potential snowshoe hare habitat throughout the turbine portion of the Project area and also along portions of the North Line and Bridal Path Line (Figures 3, 4, and 5).

Table 1 and Figures 3, 4 and 5 illustrate the results of the remote sensing habitat assessment related to the Project area and the local landscape perspective. A total of approximately 5,989 acres (2,424 ha) of current high- and moderate-value potential hare-lynx habitat were mapped within the one-mile offset survey area surrounding the proposed turbine string. Another 631 acres (255 ha) of current hare-lynx habitat were identified in the 2,000'-wide corridor centered on the portion of the North Line generator lead within lynx Critical Habitat, with an additional 566 acres (229 ha) of current habitats along the North Line and Bridal Path Line within the lynx Review Area.

Our remote sensing analyses indicate that approximately 6.4 percent of the Project assessment area (i.e., the 1-mile offset from turbines) contains regenerating softwood habitat types. The sizes and concentrations of these stands appear suitable on a landscape level for providing sufficient hare and lynx habitat over the several townships encompassing the Project area. Approximately 10.6 percent of the 2,000-foot wide assessment area along the North Line and Bridal Path Line also contain regenerating softwood habitat that appears to currently offer high- and moderate-value hare-lynx habitats (Figures 3, 4 and 5 and Table 1).

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**Table 1.** Summary of potential hare-lynx habitat in the vicinity of the Number Nine Wind Farm, as identified by interpretation of 2011 and 2013 aerial photographs and NLCD land cover data.

Potential Hare-Lynx Habitat Category	Canada Lynx Habitat Assessment Areas (Acres)					
	Turbine Area	North Generator Lead in Lynx Critical Habitat	North Generator Lead in Lynx Review Area	Bridal Path (in Review Area)	Totals	Percent of Total
Current <sup>1</sup>	5,989	631	0	566	7,186	6.9%
Future <sup>2</sup>	16,494	427	202	1,709	18,832	18.1%
Matrix Habitat <sup>3</sup>	59,863	1,653	946	2,665	65,127	62.4%
Other (Non-forest) <sup>4</sup>	10,715	295	491	1,693	13,194	12.6%
Totals:	93,061	3,006	1,639	6,633	104,339	100%

1. Current = Currently-existing high- and moderate-value hare-lynx habitat (dense softwood regeneration)

2. Future = Recent cuts with young regeneration and existing conifer-dominated forests

3. Matrix = Other forested habitats

4. Other (Non-forest) = Open water, non-forested vegetated cover types, developed areas, and non-vegetated areas

## 3.1.2 Field Checks

During the three snow track surveys in January, February, and April 2014, Stantec field scientists ground-truthed a total of 39 of the hare habitat areas identified in preliminary remote sensing efforts. These habitat polygons included 17 high-value, 12 moderate-value, 2 future, and 8 questionable areas that were found to be lacking suitable hare habitat. The majority of field-checked habitat polygons were correctly identified as to regeneration size class, relative amount and density of coniferous cover, and their overall suitability as potential hare habitat. Results from these field verifications revealed that the desktop habitat analysis was a relatively accurate predictor of available potential snowshoe hare habitat within the Project area. The field surveys and review of 2011 and 2013 aerial imagery also confirm that, as expected in a working forest, the stands and habitat types are dynamic landscape features subject to change from year to year.

## 3.1.3 Habitat Mapping Summary

The primary objective was to report the amounts and relative proportions of habitats within the assessment areas that could potentially support relatively high populations of hare, versus those habitats that likely would not adequately provide the conditions to support hare populations. It

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

is assumed that preferred lynx feeding habitats will consist of suitable hare habitat, which would include primarily regenerating softwood and mixed-wood stands. In this region, these habitat types are located mostly in active forest management areas, with the optimum habitat conditions for hare reported to be 10–30 years post-harvesting (Robinson 2006). Because the age of regeneration cannot effectively be determined by remote sensing in most cases, areas of observable softwood or mixed-wood regeneration were mapped regardless of the exact age-class. In this way, the identified areas represent a wide range of forest age- and size-classes that could provide hare habitats of varying quality, currently and into the future.

From a landscape perspective, the Project area generally appears to contain an abundance of regenerating forest habitat that could support populations of snowshoe hare and lynx. The habitat conditions observed on 2011 and 2013 aerial photos vary greatly within and among the habitat categories in regard to species composition, stand density, age, and height class. Because the majority of the area is continuously changing under an active and ongoing forest management regime, the amount and suitability of the cover types and the individual habitat blocks to support hare would be considered dynamic.

In looking at the *overall potential* to support hare and lynx, Stantec estimates that a relatively large portion of the assessed area contains a combination of current *and* future hare-lynx habitats, amounting to approximately 24.2 percent (22,483 acres) of the area within approximately 1 mile of the proposed wind turbine locations and 31.3 percent (3,535 acres) of forest lands within 1,000' either side of the North Line and Bridal Path Line (refer to Table 1, based on 2013 aerial photography).

### 3.2 SNOW TRACK SURVEYS

Stantec biologists conducted three rounds of snow track surveys in the Project area and the one-mile survey area surrounding the proposed turbine locations (Figure 4). Track surveys were conducted during two-day site visits on January 30 and 31, 2014, March 3 and 4, 2014, and April 1 and 2, 2014. Tracking conditions ranged from 2–19 inches of fresh snow fall 24–48 hours before the survey.

The initial snow track survey occurred on January 30, 2014, from 8:30 am to 4:30 pm and on January 31, 2014, from 7:00 am to 3:00 pm. Snow conditions were similar between the two survey days. Approximately 4 inches of snow fell 24–48 hours prior to the survey, leaving a light powder with lynx sinking depths ranging from 4–6.5 inches. Portions of the Project area and the one-mile turbine buffer were not surveyed because landowner permission was not granted, or access was on plowed roads that had heavy logging traffic (Figure 6). Tracks observed during the first round of survey included lynx, snowshoe hare, red squirrel, moose, ruffed grouse, coyote, fisher, marten, and river otter. Surveyors recorded 25 lynx track intercepts and collected 1 scat sample (Figure 6, Table 2).

The second round of track surveys occurred on March 3, 2014 from 9:00 am to 4:30 pm and on March 4, 2014 from 7:00 am to 4:30 pm. Between 24–48 hours prior to the survey, 2 inches of

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

snow fell over a light crust resulting in excellent tracking conditions and a lynx sinking depth ranging from 0.25–2 inches. Tracks observed during this round of track surveys included lynx, eastern coyote, moose, bobcat, fisher, marten, snowshoe hare, red squirrel, river otter, ermine, and ruffed grouse. Surveyors recorded 29 lynx track intercepts (Figure 6, Table 2) and encountered a lynx crouching along the survey corridor in Township T9 R3 WELS (Photo 1).



**Photo 1.** Canada lynx observed in Township T9 R3 WELS while back-tracking a lynx trail at the Number Nine Wind Farm project area, 2014.

The third and final round of snow track surveys occurred on April 1, 2014, from 8:30 am to 5:30 pm, and on April 2, 2014 from 8:30 am to 4:30 pm. During the 24–48 hours prior to the survey, 19 inches of snow fell on the Project area and formed a light surface crust. Despite the slight crust, tracks from animals as small as red squirrels and rodent species were frequently observed breaking through and leaving tracks. Lynx sinking depths ranged from 0.25–3 inches. Tracks observed included lynx, eastern coyote, moose, bobcat, red fox, river otter, red squirrel, snowshoe hare, fisher, marten, and ermine. Surveyors recorded 30 lynx track intercepts and collected 1 scat sample (Figure 6, Table 2).

In total, Stantec recorded 84 lynx track intercepts throughout the Project area and observed 1 lynx on the survey route in Township T9 R3 WELS (Figure 6, Table 2). Detailed information for each lynx track intercept, including location, track measurements, sinking depth, STQ rating, habitat information, and photograph identification is available in Appendix A. Digital copies of lynx track photographs can be provided upon request. Surveyors collected GPS locations for each lynx track intercept, including instances where a group of lynx traveled together. The majority (n=77) of lynx tracks were located within the 1-mile survey area in Townships T8 R3 WELS and T9 R3 WELS, and 7 lynx tracks were located in E Township (Figure 6). The snow track survey effort in Township T8 R3 WELS, Township T9 R3 WELS, and E Township represents 88 percent of the 177 km

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

surveyed at the Project area (Table 3). No surveys were conducted in Dudley Township or Township TC R2 WELS, due to a lack of landowner permission, or active logging.

**Table 2.** Summary of Canada lynx snow track survey results at the Number Nine Wind Farm project area, 2014.

Survey Dates	# of Lynx Intercepts	Sinking Depth Range (in)	STQ Range
Jan 30 - 31, 2014	25	4 - 6.5	2 - 3
March 4 - 5, 2014	29	.25 - 2	3 - 4
April 1 - 2, 2014	30	.25 - 3	2 - 4
Total:	84	.25 - 6.5	2 - 4

**Table 3.** Summary of Canada lynx snow track survey route per township at the Number Nine Wind Farm project area, 2014.

Township	Total Area within 1-Miile buffer (sq.km)	km of Roads Surveyed
Dudley Twp	3.02	0
E Twp	34.72	33.53
Saint Croix Twp	0.33	0.27
T10 R3 WELS	6.4	0.04
T8 R3 WELS	63.19	61.51
T9 R3 WELS	56.63	60.97
TC R2 WELS	6.29	0
TD R2 WELS	35.85	20.25
Westfield	1.86	0.3
Total:	208.29	176.87

Thirteen distinct species tracks were observed, including snowshoe hare, red squirrel (*Tamiasciurus hudsonicus*), moose (*Alces alces*), white-tailed deer (*Odocoileus virginianus*), eastern coyote (*Canis latrans*), bobcat (*Lynx rufus*), fisher (*Martes pennanti*), marten (*Martes americana*), ermine (*Mustela erminea*), red fox (*Vulpes vulpes*), ruffed grouse (*Bonasa umbellus*), river otter (*Lontra canadensis*), and lynx.

Surveyors recorded several instances of multiple lynx traveling together. A group of three lynx was observed traveling together at three locations during the first round of survey, and at two

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

locations during the final round of survey. The three sightings during the first round of survey were within 5.2 km (3.2 mi) of each other, and all had a direction of travel to the west or southwest. Surveyors back-tracked the initial track intercept of the group of three for approximately 161 m (528') and collected a scat sample along the trail. The scat appeared to have been buried by a lynx under a shallow layer of snow in an area of moderately dense conifer where the lynx appeared to have been hunting. Later the same day, a second group of three lynx tracks was encountered 4.5 km (2.5 mi) to the west. The location, similar track condition, and westerly direction of travel indicate this was likely the same previously observed group. Surveyors back-tracked the group of three lynx and found a freshly buried snowshoe hare kill (Photo 2). The hare had not been consumed, but showed signs of puncture wounds on its neck and abdomen. During the final round of survey, two groups of three lynx track intercepts were located within 6.2 km (3.8 mi) of each other, and had a northeast direction of travel. The three groups of three observations occurred in Townships T8 R3 WELS and T9 R3 WELS, were within 6.9 km (4.25 mi) of one another, and were likely from the same group of three lynx.



**Photo 2.** Buried snowshoe hare found during lynx backtracking at the Number Nine Wind Farm project area, 2014.

During the final round of track surveys, a single lynx was back-tracked for approximately 644 m (2,113') through recently thinned regenerating conifer. Surveyors observed two unsuccessful snowshoe hare chases where the distance between lynx bounds measured nine feet (Photo 3). Shortly after the second chase, a scat sample was collected along the track, and preserved for genetic processing.

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015



**Photo 3.** Tracks showing Canada lynx chasing snowshoe hare at the Number Nine Wind Farm project area, 2014.

The two scat samples collected during lynx back-tracking in Township T8 R3 WELS were submitted for genetic processing to the USDA Forest Service Rocky Mountain Research Station, Wildlife Genetics Lab. To determine species, the lab performs analysis of mitochondrial DNA in the scat sample to determine if samples are from Canada lynx, including whether there is evidence of hybridization with bobcat. At the time of this report, genetics results were not available. When received, results of the species and sex determination will be included in an updated version of this report.

### 4.0 DISCUSSION

Desktop analysis of potential snowshoe hare and lynx habitat using aerial photography and GIS software confirmed relatively abundant suitable habitat currently exists within the Project assessment area. Estimates indicate that approximately 6.4 percent (5,989 acres) of the assessment area within 1 mile of the proposed wind turbines and 10.6 percent (1,197 acres) within 1,000 feet of either side of the generator lead contain high- and moderate-value habitats that may currently support relatively high densities of snowshoe hare. Another 17.7 percent (16,494 acres) in the Project assessment area and 20.7 percent (2,338 acres) of the generator lead assessment area contain softwood-dominated forests and recent clearcuts that could potentially provide suitable hare-lynx habitat in the future (Table 1).

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

Three rounds of snow track surveys confirmed abundant snowshoe hare sign throughout the Project area. A network of wide and well-maintained roads extends throughout the Project area. Although individual snowshoe hare tracks crossed the roads, few heavily used hare runs were observed crossing the wide road clearings. Incidental observations suggest that red squirrels were more likely to cross the wide road clearings and their trails seemed to cross roadways more frequently than snowshoe hare runs. However, abundant snowshoe hare runs were commonly observed under the protective layer of dense canopy cover found beyond the road edge. In the instances where lynx back-tracking occurred, surveyors followed winding lynx tracks through pockets of dense snowshoe hare sign. The cached snowshoe hare found while back-tracking the group of three lynx is an indication of high value habitat and abundant prey density (Jennifer Vashon, personal communication).

Of the 84 lynx tracks encountered, 13 were associated with (i.e., within or less than 30m away) polygons identified as high-value habitat and 13 were associated with moderate-value habitats. Additionally, two lynx track intercepts were associated with areas identified as future value habitat, and four were associated with mature coniferous or mixed forest stands. The abundant lynx sign included multiple intercepts of groups of three lynx traveling and hunting together. Although some individual tracks may be from transient lynx moving through the Project area, the multiple occurrences of groups of lynx throughout Township T8 R3 WELS and T9 R3 WELS likely indicate the Project area supports a breeding population of lynx.

Though lynx and snowshoe hare habitat is dynamic and constantly changing as a result of forest succession and the actively managed industrial forest landscape, it appears that past forestry practices within the Project area and the surrounding region have created favorable conditions for hare and lynx, with regenerating softwood stands currently common on the landscape. Given the past and ongoing history, a similar type - and level - of private, commercial, and industrial forest management activity is expected to continue within the region for the foreseeable future, and as such, should continue to similarly support habitat conditions that maintain viable hare/lynx populations.

## CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

### 5.0 LITERATURE CITED

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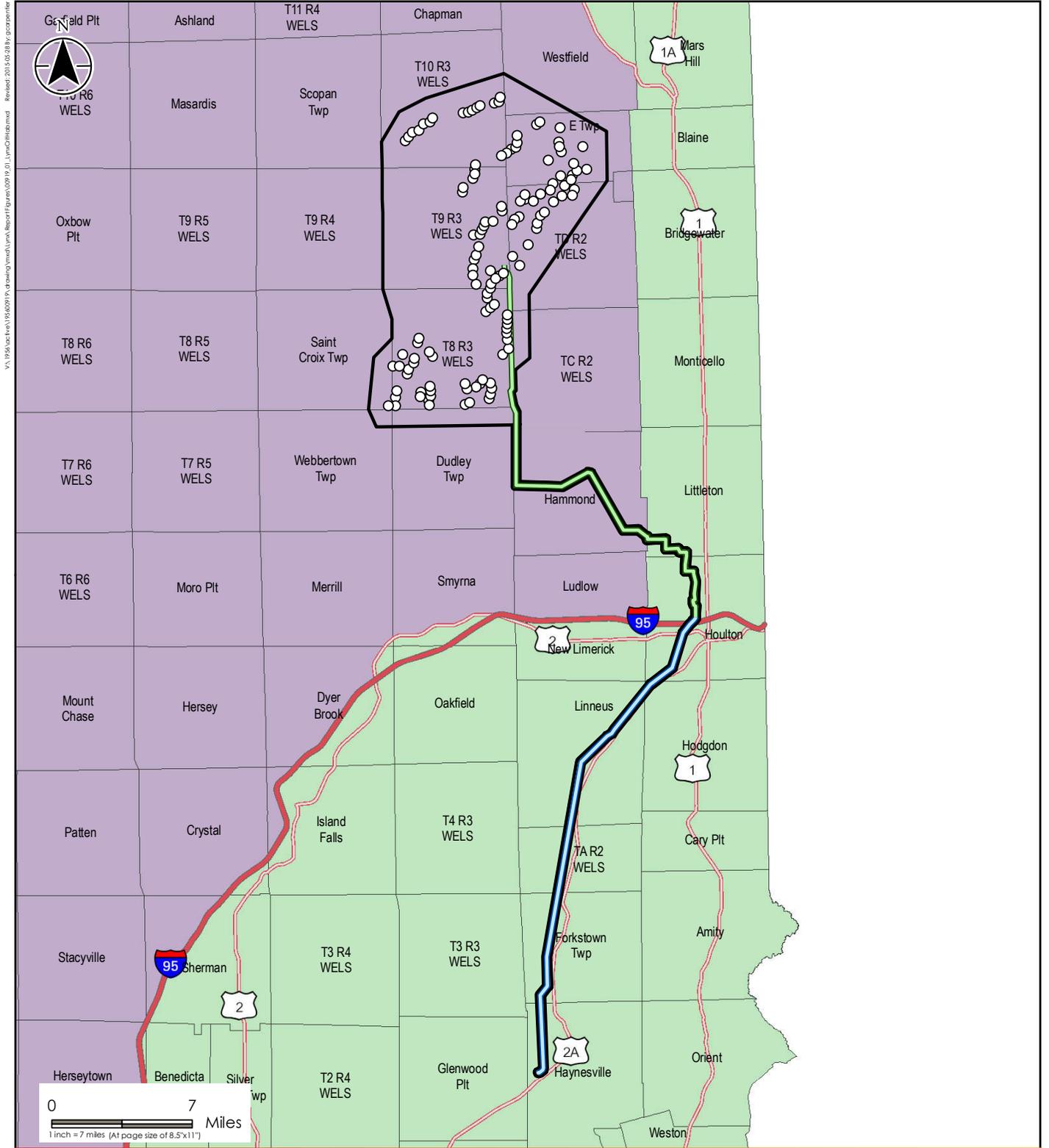
Vashon, J., S. McLellan, S. Crowley, A. Meehan, and K. Laustsen. 2012. Canada Lynx Assessment. Maine Department of Inland Fisheries and Wildlife, Research and Assessment Section, Bangor, ME.

# CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM

May 28, 2015

## Figures

- Figure 1.** Project Area Map
- Figure 2.** Survey Area
- Figures 3, 4, & 5.** Canada Lynx Habitat Assessment
- Figure 6.** Canada Lynx Tracking Survey



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195600919



30 Park Drive  
 Topsham, ME USA 04086  
 Phone (207) 729-1199

Prepared by GAC on 2015-05-12  
 Reviewed by JYP on 2015-05-13

00919\_01\_LynxCritHab.mxd

**Legend**

- Proposed Turbine Location
- North Generator Lead
- Bridal Path Generator Lead
- ▭ Lynx Habitat Assessment Area
- ▭ Canada Lynx Critical Habitat
- ▭ Canada Lynx Review Area

**Client/Project**

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

**Figure No.**

1

**Title**

Project Location Map

5/28/2015



**Legend**

- Proposed Turbine Location
- North Generator Lead
- Snow Track Survey Area
- Lynx Habitat Assessment Area
- Canada Lynx Critical Habitat
- Town Boundary



1:190,080 (At Original document size of 8.5 x 11)

- Notes**
1. Coordinate System: NAD 1983 StatePlane Maine East FIPS 1801 Feet
  2. Base features provided by Stantec, Maine Office of GIS (MEGIS)
  3. 2013 National Agriculture Imagery Program (NAIP) aerial orthoimagery provided by Natural Resource Conservation Service and the Farm Service Agency.



Project Location: Aroostook County, Maine  
 Prepared by GAC on 2014-4-25  
 Review by JYP on 2014-4-25

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

Figure No. **2**

Title: **Snow Track Survey Area**

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 Revised: 2015-05-28 By: acap@stantec.com





**Legend**

- Turbine Layout
- Current Canada Lynx-Hare Habitat
- Future Canada Lynx-Hare Habitat
- Matrix Forest
- Other
- Canada Lynx Habitat Assessment Area
- Canada Lynx Critical Habitat
- Canada Lynx Review Area

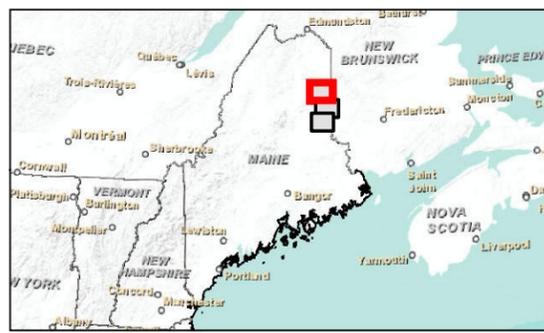
**Habitat Assessment**

The Canada lynx habitat assessment area included areas within 1-mile of proposed turbines and within 1,000 feet of the proposed generator lead. To identify potential lynx habitats, Stantec reviewed 2011 and 2013 digital aerial imagery available from the ESRI web mapping service and the Google Earth website. The imagery was viewed on-screen in 2-D using ArcGIS® software. Habitat types known to be preferred by snowshoe hares and Canada lynx were identified on the imagery and digitized into polygons representing potential habitats. These include current lynx/hare habitats (high-value and moderate-value) and future habitats. Future habitats are recent timber harvest areas with young conifer regeneration, plus areas of existing conifer forest that could be harvested and contain regenerating coniferous growth in the future. Future habitats were derived from Stantec's aerial photo interpretation of recent timber harvests and from the National Land Cover Data that indicate coniferous forest cover. Mapping is based on conditions existing at the time the imagery and land cover data were collected.

Given that hares are the preferred food of lynx, it is assumed that if a habitat could support hare populations, it is a potential lynx feeding habitat. The preferred habitats for snowshoe hares typically include dense stands of regenerating coniferous forest that provide them with food and cover. Typical high-value hare habitats are characterized by dense, contiguous stands of regenerating coniferous forest approximately 10 – 35 years old. Moderate-value hare habitats are defined herein as those that appear to provide suitable conditions, but stand density, age, and/or species composition are not optimal for food and cover. Future hare habitats include recently harvested forest areas that may become suitable for hare as the age and density of regeneration progresses over time, including clearcuts or thinned stands with obvious signs of coniferous regeneration. Future habitats also include un-harvested coniferous or mixed coniferous-deciduous forests in the assessment area.

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 19N
2. Orthoimagery: NAIP 2013
3. Maine Political Boundaries: MEGIS 2014
4. Canada Lynx Critical Habitat: USFWS 2014



195600919

Project Location  
E Township, T8R3 WELS, T9R3 WELS,  
T10R3 WELS, and TDR2 WELS  
Aroostook County, Maine

Prepared by FJD on 2015-05-07

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

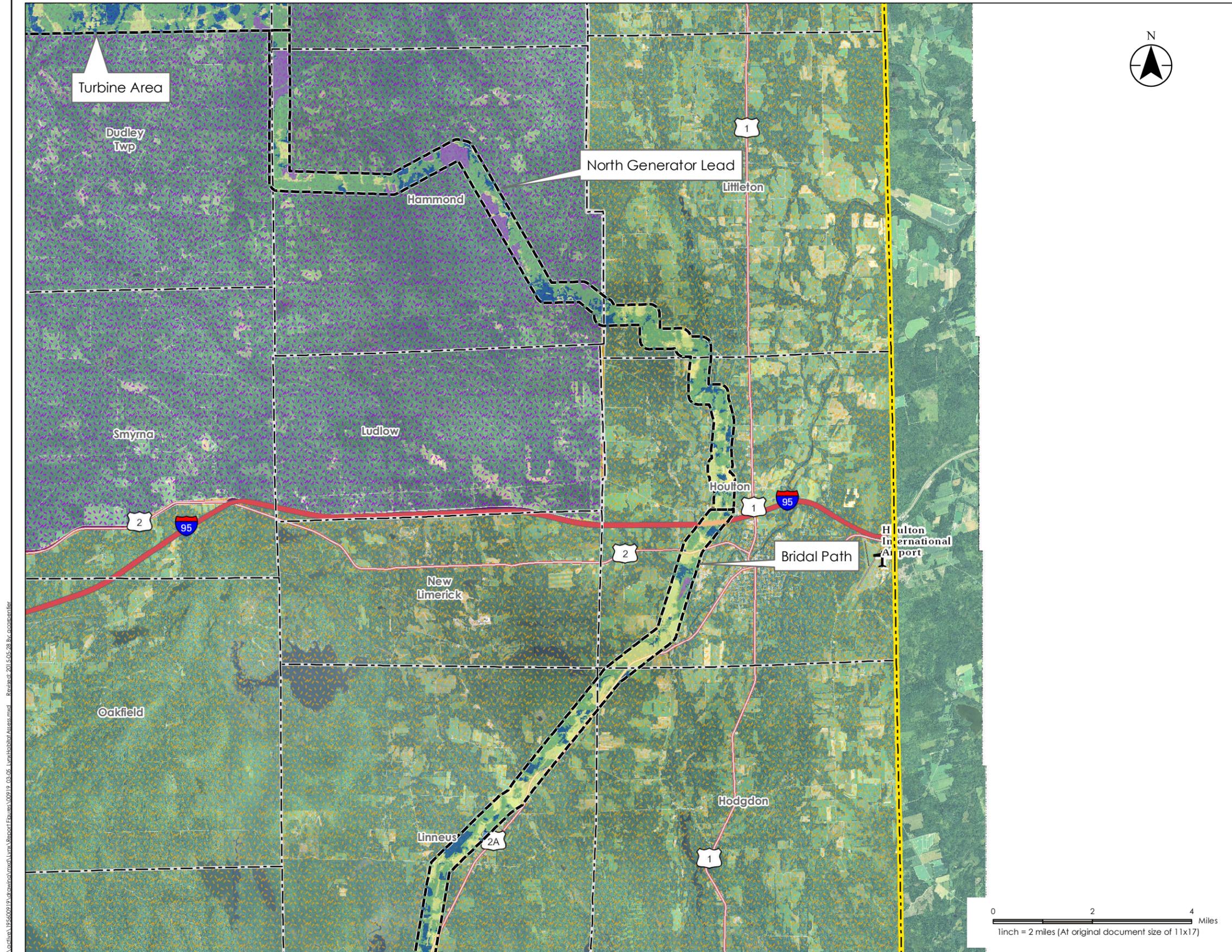
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Figure No.  
**3**

---

Title  
**Canada Lynx Habitat**

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Turbine Area

Dudley Twp

North Generator Lead

Hammond

Littleton

Smyrna

Ludlow

Houllon

Bridal Path

Houlton International Airport

New Limerick

Oakfield

Linneus

Hodgdon



Legend

- Turbine Layout
- Current Canada Lynx-Hare Habitat
- Future Canada Lynx-Hare Habitat
- Matrix Forest
- Other
- Canada Lynx Habitat Assessment Area
- Canada Lynx Critical Habitat
- Canada Lynx Review Area

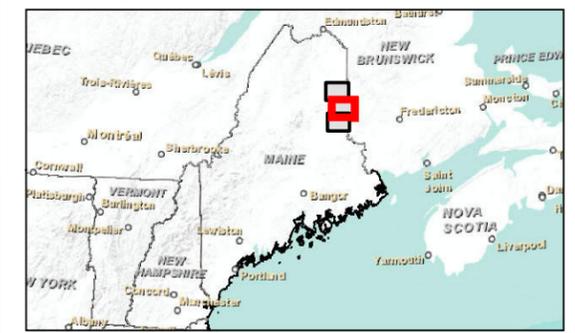
Habitat Assessment

The Canada lynx habitat assessment area included areas within 1-mile of proposed turbines and within 1,000 feet of the proposed generator lead. To identify potential lynx habitats, Stantec reviewed 2011 and 2013 digital aerial imagery available from the ESRI web mapping service and the Google Earth website. The imagery was viewed on-screen in 2-D using ArcGIS® software. Habitat types known to be preferred by snowshoe hares and Canada lynx were identified on the imagery and digitized into polygons representing potential habitats. These include current lynx/hare habitats (high-value and moderate-value) and future habitats. Future habitats are recent timber harvest areas with young conifer regeneration, plus areas of existing conifer forest that could be harvested and contain regenerating coniferous growth in the future. Future habitats were derived from Stantec's aerial photo interpretation of recent timber harvests and from the National Land Cover Data that indicate coniferous forest cover. Mapping is based on conditions existing at the time the imagery and land cover data were collected.

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Notes

1. Coordinate System: NAD 1983 UTM Zone 19N
2. Orthimagery: NAIP 2013
3. Maine Political Boundaries: MEGIS 2014
4. Canada Lynx Critical Habitat: USFWS 2014



Project Location: E Township, T8R3 WELS, T9R3 WELS, T10R3 WELS, and TDR2 WELS, Aroostook County, Maine  
 195600919  
 Prepared by FJD on 2015-05-07

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

Figure No.

**4**

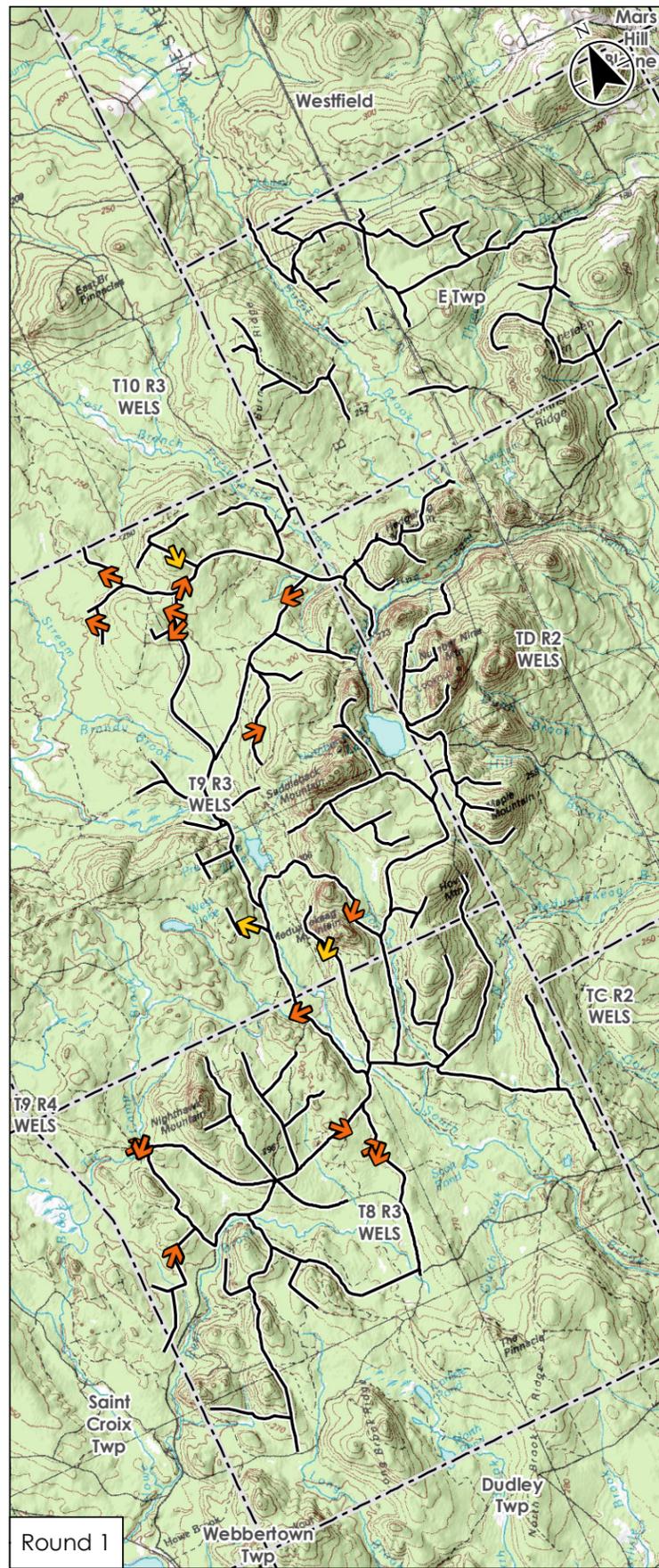
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**Canada Lynx Habitat**

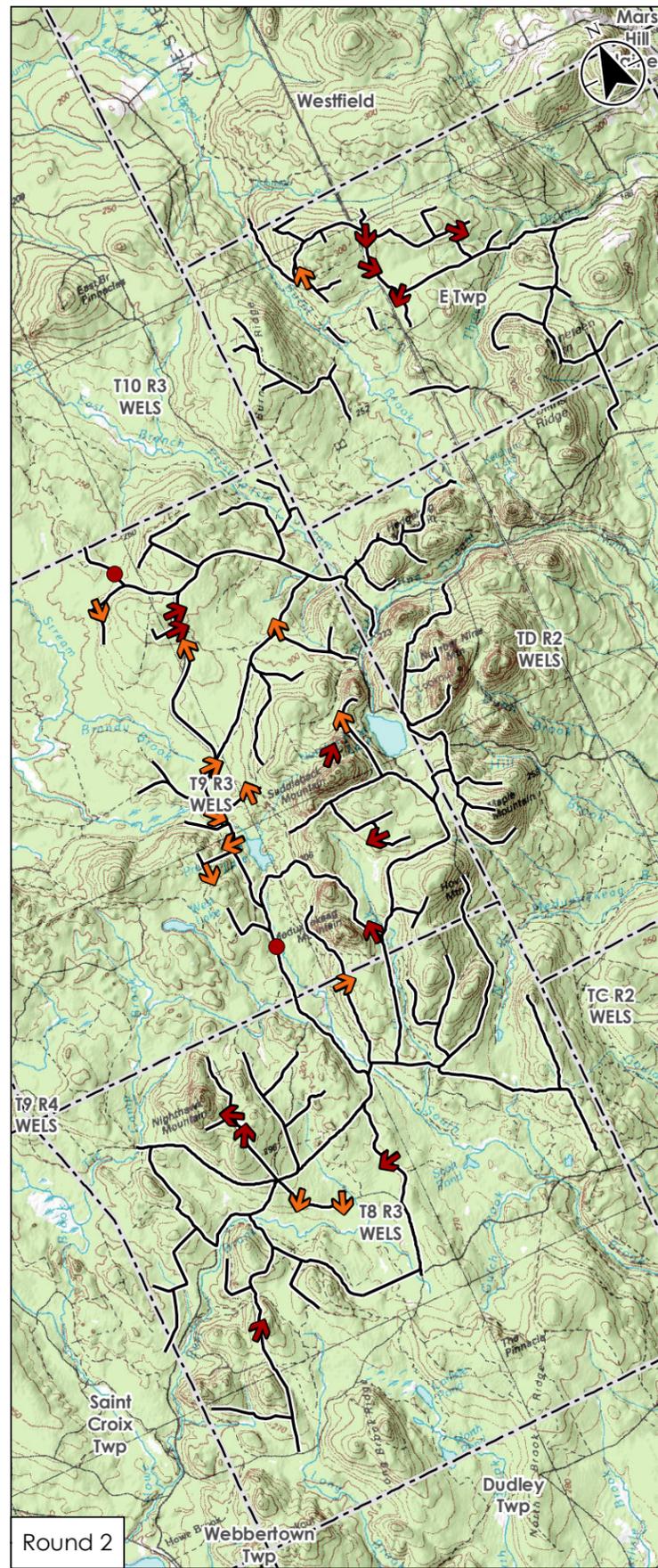
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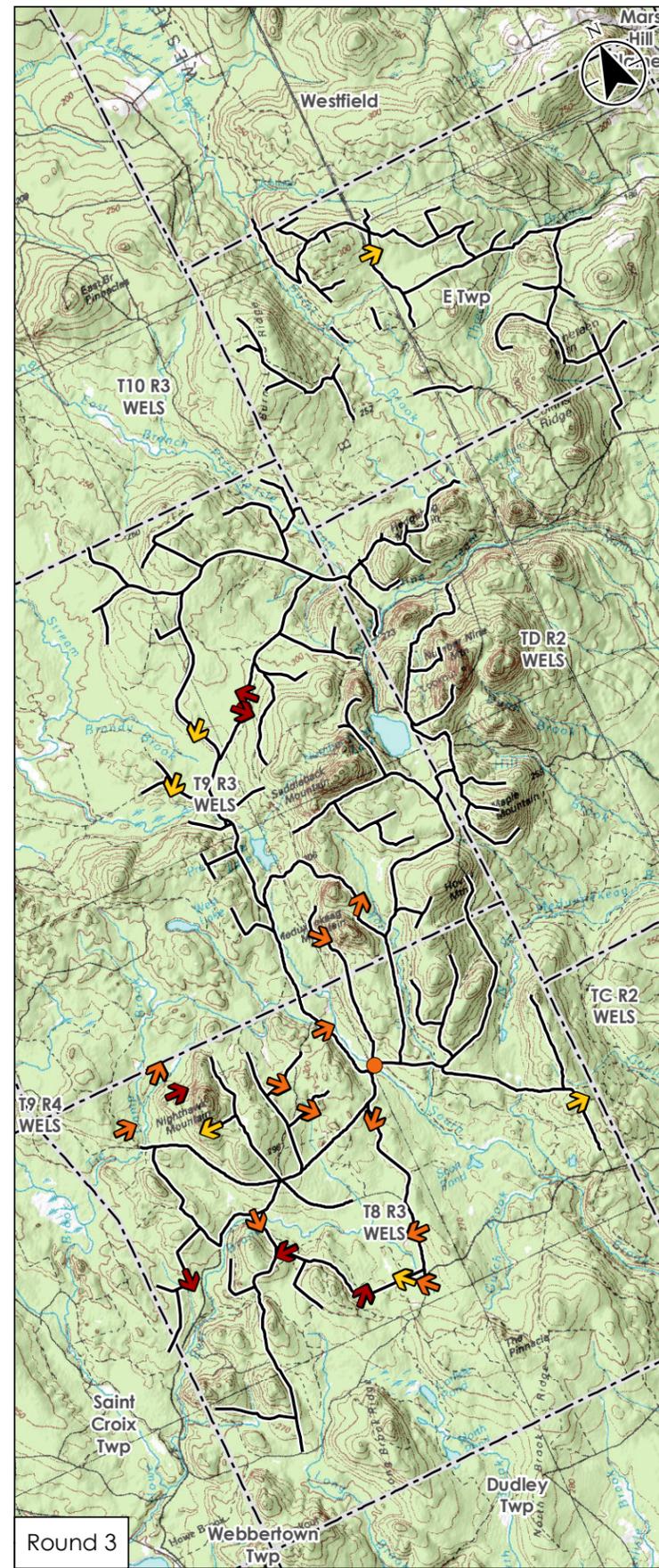
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Round 1



Round 2



Round 3



Legend

Lynx Track Location (Arrow indicates Direction of Travel)

Snow Track Quality

- ↑ 2
- ↑ 3
- ↑ 4

Lynx Track Location (No Travel Direction)

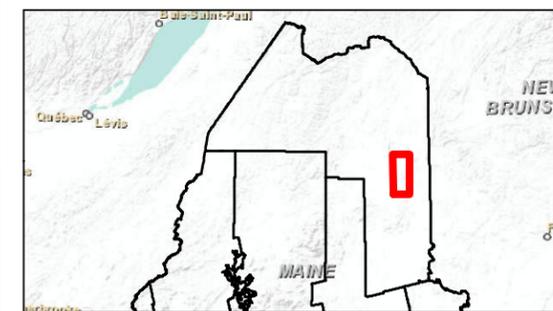
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- 4

— Survey Effort

--- Township Boundary

Notes

1. Coordinate System: NAD 1983 UTM Zone 19N
2. Base Map: USGS 1:100,000 Topographic Map
3. Maine Political Boundaries: MEGIS 2014



Project Location  
E Township, T8R3 WELS, T9R3 WELS,  
T10R3 WELS, TCR2 WELS, and TDR2 WELS  
Aroostook County, Maine

195600919  
Prepared by GAC on 2014-04-25  
Reviewed by SAB on 2014-04-25

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

Figure No.

6

Title

**Canada Lynx  
Snow Tracking Survey**

**CANADA LYNX HABITAT ASSESSMENT AND 2014 WINTER TRACK SURVEYS, NUMBER NINE WIND FARM**

May 28, 2015

**Appendix A CANADA LYNX SNOW TRACKING DATA**

Track ID	Lat	Long	Length	Width	Stride	Straddle	Sinking Depth	DOT	STQ	Photos	Habitat	DNA Collected?	Observation
1SAB_L1_1/30	46.3781	-68.09898	4.25	4.5	16	9	4.5	W	3	3865 - 3876	Mature, SH, 1, 5, B	scat	This cat was seen traveling with two others. Scat sample collected during backtrack of L1, L2, L3. Scat was buried by lynx.
1SAB_L2_1/30	46.3781	-68.09898	4	4.25	13	7.75	4	w	3	3877 - 3878	Mature, SH, 1, 5, B	--	Traveling with L1 and L3.
1SAB_L3_1/30	46.3781	-68.09898	4	4.75	15	9	5	w	3	3879	Mature, SH, 1, 5, B	--	Traveling with L1 and L2.
1SAB_L4_1/30	46.35066	-68.09701	4	4.75	16	9.5	5.5	E	3	3880 - 3894	Mature, SH, 1, 5, B	--	Seems more fresh than last tracks - lots of scent marking.
1SAB_L5_1/30	46.34941	-68.09638	4.25	4.75	17	9	5	SW	3	3895	Regen, S, 1, 5, A	--	Probably the same as L4.
1SAB_L6_1/30	46.34903	-68.15526	4.25	4.5	16	8.75	6.5	NE	3	3900 - 3902	n/a	--	--
1SAB_L7_1/30	46.349	-68.15527	4.25	4.5	17	8.5	5.25	NE	3	3903 - 3904	Regen, S, 1, 5, A	--	--
1SAB_L8_1/30	46.36899	-68.15149	4	4.75	16	8.5	6	E	3	3905 - 3907	Mature, SH, 2, 5, B	--	--
1SAB_L9_1/30	46.36869	-68.15053	3.5	4.25	15.5	7.5	5	SW	3	3909 - 3918	Mature, S, 1, 5, B	--	Group of three traveling together, L9, L10, L11.
1SAB_L10_1/30	46.3687	-68.15052	4	4.5	18	9	5.5	SW	3	3909 - 3918	Mature, S, 1, 5, B	--	Group of three traveling together, L9, L10, L11.
1SAB_L11_1/30	46.3687	-68.15052	4	4.25	17	8.5	5.5	SW	3	3909 - 3918	Mature, S, 1, 5, B	--	Group of three traveling together, L9, L10, L11, found a freshly killed snowhoe hare buried in the snow, uncovered the buried hare and found it still warm - very fresh kill.
1SAB_L12_1/30	46.35638	-68.10234	4.25	4.5	16.5	8.75	6.25	SE	3	3919 - 3920	Mature, S, 1, 5, B	--	Possibly the same as L04.
1SAB_L13_1/30	46.3902	-68.07527	4.25	4.75	16.5	8.75	5.5	SW	3	3921 - 3924	Regen, S, 1, 4, A	--	--
1SAB_L14_1/31	46.3862	-68.08557	4	4.5	17	9	6	SW	2	3930 - 3943	Mature, H, 2, 4, C	--	Possibly the same group of three from the previous day.
1SAB_L15_1/31	46.3862	-68.08557	4	4.25	16	8.5	5.5	SW	2	3930 - 3943	Mature, H, 2, 4, C	--	Possibly the same group of three from the previous day.
1SAB_L16_1/31	46.3862	-68.08557	3.75	4.25	16	8	5.5	SW	2	3930 - 3943	Mature, H, 2, 4, C	--	Possibly the same group of three from the previous day.
1SAB_L17_1/31	46.39588	-68.10143	4.25	4.5	16	8.5	5.5	NW	2	3944 - 3945	Mature, H, 2, 4, C	--	--
1JSP_L1_1/30	46.445486	-68.054857	3.5	3.8	16.75	10	6	W	3	JSP01_01 - JSP01_10	n/a	--	--
1JSP_L2_1/30	46.460447	-68.077365	3.5	4	15.75	8.25	5.5	S	2	JSP02_01 - JSP02_10	n/a	--	--
1JSP_L3_1/30	46.455147	-68.079084	3.5	3.6	14	10	5.5	NE	3	JSP03_01 - JSP03_04	Regen, S, 1, 4, B	--	--
1JSP_L4_1/30	46.462558	-68.094559	3.75	3.75	16.5	8.5	--	NW	3	JSP04_01 - JSP04_05	Mature, S, 1, 5, A	--	--
1JSP_L5_1/30	46.455868	-68.102857	3.5	4.25	18	7.25	5.5	NW	3	JSP05_01 - JSP05_11	Regen, SH, 1, 5, C	--	--
1JSP_L6_1/30	46.451534	-68.083732	3.5	4	15.75	9	5	NW	3	JSP06_01 - JSP06_06	Regen, SH, 1, 4, B	--	--
1JSP_L7_1/30	46.448599	-68.085064	3.75	4.25	16.5	8.5	--	WSW	3	JSP07_01 - JSP07_04	n/a	--	--
1JSP_L8_1/30	46.426366	-68.078427	3.25	3.5	15.5	8.5	5.5	E	3	JSP08_01 - JSP08_06	Mature, HS, 2, 5, B	--	--
2SAB_L1_3/4	46.49099	-67.9757	3.25	3.5	9.5	5.25	0.5	SE	4	4030 - 4046	Mature, HS, 1, 5, C	--	Mostly walking straight path. Stops briefly in conifer patch, near area with lots of hare sign.
2SAB_L2_3/4	46.48509	-67.99633	3.75	4.5	11.5	5.5	0.5	SW	4	4075 - 4082	Mature, SH, 1, 5, C	--	Seems like a bigger cat - breaking through the light crust frequently. Walking down snowmobile trail.
2SAB_L3_3/4	46.49183	-68.00001	3.5	4.25	12.5	7.5	0.5	SE	4	4087 - 4089	Regen, S, 1, 4, A	--	Probably the same animal as L02.
2SAB_L4_3/4	46.49727	-67.99764	3.75	4.25	10.5	7	0.5	SSW	4	4096 - 4100	Regen, S, 1, 4, A	--	Probably one of these cats is L3. These 2 tracks are very close to the L3 track - moving in the same DOT - walking along snowmobile trail.
2SAB_L5_3/4	46.49727	-67.99764	3.75	4.5	14	8	0.5	SSW	4	4096 - 4100	Regen, S, 1, 4, A	--	Probably one of these cats is L3. These 2 tracks are very close to the L3 track - moving in the same DOT - walking along snowmobile trail.
2SAB_L6_3/4	46.49554	68.01655	3.25	4	13.5	6.5	0.25	N	3	4113 - 4114	Regen, S, 1, 4, A	--	Walking along road - slightly wind-blown.
2SAB_L7_3/5	46.41708	-68.06352	3.25	4.25	17	8.5	0.5	NE	4	4129 - 4132	Regen, HS, 1, 4, B	--	Walked down road, walking off hardwood ridge.
2SAB_L8_3/5	46.40024	-68.06194	3.5	4.25	11.5	8	0.75	W	4	4146 - 4153	Mature, S, 2, 5, B	--	Crossing road.

2SAB_L9_3/5	46.42152	-68.05672	3.5	4	16	6.5	0.5	N	3	4153 - 4156	Mature, HS, 1, 5, B	--	Tracks very wind blown along trail, but better under cover.
2SAB_L10_3/5	46.3856	-68.07317	3.5	4.25	16	8	0.25	N	4	4169 - 4171	Regen, HS, 1, 4, B	--	Walking along snowmobile trails, then dipping off towards cedar swamp, scent marking prominent veg.
2SAB_L11_3/5	46.37931	-68.0854	3.25	4.25	15	7.5	0.25	E	3	4177 - 4179	n/a	--	Wind blown, but good tracks in sheltered areas.
2JML_L1_3/4	46.34453	-68.11053	4.25	5	17	8.5	0.25	SW	3	6169 - 6174	Mature, S, 1, 5, B	--	Tracks observed along roadside travelling SE, crossing SW into a dense fir plantation.
2JML_L2_3/4	46.34824	-68.12016	4	4.5	15	7.75	0.5	SW	3	6179 - 6184	Mature, S, 1, 4, B	--	This may be more than 1 individual, as tracks were criss-crossing in some places and very hard to follow.
2JML_L3_3/4	46.33069	-68.14373	4	4.5	20	6.5	0.5	NE	4	6189 - 6195	Mature, SH, 2, 4, B	--	Lynx crossed a clear cut area with 3-5' beech regrowth before travelling on road for several hundred feet.
2JML_L4_3/5	46.34747	-68.09507	3.5	4	16	7	0.5	W	4	6200 - 6205	Mature, SH, 2, 4, B	--	Solitary individual whose tracks were observed meandering adjacent to road in a recently thinned mixed-woods area.
2JML_L5_3/5	46.36288	-68.12568	3	3.5	17.5	7	0.5	NE	4	6207 - 6210	Mature, S, 2, 4, A	--	Solitary individual walking treeline along road.
2JML_L6_3/5	46.36704	-68.12644	4	4	18	7.5	0.75	NW	4	6211 - 6221	Mature, HS, 2, 5, B	--	Solitary individual walking generally north along road, coming in and out of tree/shrub line.
2CWF_L2_3/4	46.45785	-68.1014	2.75	3.5	16.5	5.75	0.75	S	3	1168 - 1171	Mature, SH, 2, B	--	Track along ditch disappears to the south (wind blown snow).
2CWF_L3_3/4	46.46258	-68.09351	4	4.5	15	7	0.75	--	4	1175 - 1177	Mature, S, 2, C	--	Wetland, cedar swamp.
2CWF_L5_3/4	46.44135	-68.06183	4	4.5	18	6.75	--	N	3	1182 - 1185	Mature, S, 2, A	--	--
2CWF_L6_3/4	46.45172	-68.08352	3.75	4.25	16	7	0.75	E	4	n/a	Mature, S, 2, A	--	--
2CWF_L7_3/4	46.4486	-68.08509	3.5	4	14	6.5	0.5	E	4	n/a	Mature, S, 2, A	--	Lynx observed crouching in trail - photo 1182, 1185 - photos also taken of tracks left by lynx.
2CWF_L8_3/4	46.44498	-68.085	4	4.5	14	6.5	0.5	N	3	n/a	n/a	--	Camera battery died
2CWF_L9_3/4	46.42428	-68.09239	3.5	3.5	15	6	0.5	E	3	n/a	Mature, S, 1, B	--	Camera battery died
2CWF_L10_3/4	46.41737	-68.08639	3.5	4	15	6	0.5	N	3	n/a	Mature, HS, 2, B	--	Camera battery died
2CWF_L11_3/5	46.4161	-68.09698	3.25	3.5	15	6.75	0.5	SE	3	n/a	Mature, S, 2, A	--	Camera battery died
2CWF_L12_3/5	46.41048	-68.09602	3.75	4	15	6.75	0.5	W	3	n/a	Mature, SH, 2, B	--	Camera battery died
2CWF_L13_3/5	46.40713	-68.10496	3.75	4.25	16	7.5	0.5	S	3	n/a	Mature, H, 1, B	--	Camera battery died
2CWF_L15_3/5	46.39052	-68.09736	3.75	4.5	15	7	2	--	4	n/a	Mature, S, 2, B	--	Camera battery died
3JSP_L1_4/1	46.391256	-68.074254	3.6	3.4	15	7.5	1.25	NE	3	L01_JSP_01-L01_JSP_10	Regen, SH, 6, 3	--	--
3JSP_L2_4/1	46.389012	-68.086983	4	4.25	15.5	8	0.75	SE	3	L02_JSP_01 - L02_JSP_06	Mature, HS, 3, B	--	--
3JSP_L3_4/1	46.364284	-68.088716	4.5	4.25	18	9	2.5	--	3	L03_JSP_01-L03_JSP_03	Mature, SH, 2, B	--	--
3JSP_L4_4/1	46.424501	-68.104009	5	4.25	16.5	8		SW	2	L04_JSP_01 - L04_JSP_05	Regen, SH, 1, D	--	--
3JSP_L5_4/1	46.431421	-68.092551	4.5	4.5	17.5	8	2	SW	2	L05_JSP_01 - L05_JSP_05	Regen, S, 6, D	--	--
3JSP_L6_4/1	46.433348	-68.077176	4.25	4.25	17	7	2.5	NW	4	L06_JSP_01 - L06_JSP_04	Regen, SH, 6, D	--	--
3JSP_L7_4/1	46.431404	-68.079312	3.75	3.5	16	6.75	0.5	--	4	L07_JSP_01 - L07_JSP_04	Regen, S, 5, D	--	--
3JSP_L8_4/1	46.430955	-68.079912	4.25	4	16.5	8	0.5	SE	4	L08_JSP_01 - L08_JSP_04	Regen, S, 5, D	--	--
3JSP_L9_4/1	46.494122	-67.99922	4.5	4.25	17	8	2.5	E	2	L09_JSP_01 - L09_JSP_07	Mature, SH, 2, B	--	--
3SAB_L1_4/1	46.37386	-68.09631	3.25	3.5	15	6.5	3	E	3	4306 - 4309	Mature, SH, 1, 4, C	--	Slightly crusty, but breaking thru - red squirrels are breaking thru, leaving clear tracks.
3SAB_L2_4/1	46.3558	-68.09483	3.75	4	16	6.5	3	SW	3	4310 - 4336	Mature, HS, 1, 5, C	scat	Seems to be a big cat, deep prints, appears to be hunting.
3SAB_L3_4/2	46.33449	-68.09741	3.75	4	15	6.5	0.25	W	4	4339 - 4342	Mature, SH, 1, 5, B	--	Traveling with other track (L4) - although L4, seems more wind blown and may be a slightly older track.
3SAB_L4_4/1	46.33439	-68.09741	3.75	4	17	7.5	2	W	3	4343 - 4347	Mature, SH, 1, 5, B	--	Traveling with L3, although L4 seems like a slight more wind blown, and possibly older track.

3SAB_L5_4/1	46.32524	-68.1007	3.75	4.5	14.5	6.5	0.25	NW	3	4348 - 4355	Mature, S, 2, 5, A	--	Wind blown on road, but better quality track off the road.
3SAB_L6_4/1	46.32795	-68.10539	3.25	4.5	16	6.5	0.25	NW	2	4356 - 4368	Regen, S, 1, 5, A	--	Walked down unplowed road.
3SAB_L7_4/1	46.3284	-68.11663	3.5	4.25	17	6.5	1.25	NE	4	4369 - 4373	Mature, SH, 1, 5, C	--	With L8 and L9.
3SAB_L8_4/1	46.3284	-68.11663	3	3.75	14	5.5	0.25	NE	4	4374 - 4375	Mature, SH, 1, 5, C	--	With L7 and L9, smaller than L7, walking next to L7.
3SAB_L9_4/1	46.3284	-68.11663	3	3.75	14.5	5	0.25	NE	4	4376 - 4379	Mature, SH, 1, 5, C	--	With L7 and L8, smaller than L7, walking ~15' away from L7 and L8.
3SAB_L10_4/1	46.34138	-68.12985	3.5	4.5	17	6.5	3	W	4	4382 - 4384	Mature, H, 2, 5, C	--	Appears to be a different cat than the L7 group of three.
3SAB_L11_4/1	46.34851	-68.13328	3.25	4	15.5	6	2	S	3	4385 - 4387	Mature, HS, 2, 5, B	--	Single cat.
3SAB_L12_4/2	46.36225	-68.1088	3.25	3.75	16.5	7	1.5	SE	3	4437 - 4440	Mature, S, 2, 5, B	--	Tracks a little melted out, but good detail under the canopy.
3SAB_L13_4/2	46.36865	-68.11294	3.5	3.75	15	6.5	2	SE	3	4452 - 4455	Regen, S, 1, 5, C	--	Probably the same as L12, same age track, same DOT, not far away.
3SAB_L14_4/2	46.36694	-68.13373	3.5	4.25	16.5	7	0.75	W	2	4458 - 4461	Regen, H, 1, 5, C	--	Windblown, but OK detail in more protected areas.
3SAB_L15_4/2	46.37506	-68.1375	3.5	4.25	15.5	6.5	0.75	E	4	4462 - 4468	Mature, SH, 2, 5, B	--	Fairly fresh, great detail.
3SAB_L16_4/2	46.37996	-68.13995	3.5	4	14	6	1	NE	3	4469 - 4472	Regen, S, 1, 5, B	--	Traveling with L17 and L18. Mature riparian buffer to the south.
3SAB_L17_4/2	46.37996	-68.13995	3.5	4.25	15	5.5	1.5	NE	3	4473 - 4474	Regen, S, 1, 5, B	--	Traveling with L16 and L18. emerged from riparian, walked down trail into dense regen.
3SAB_L18_4/2	46.37996	-68.13995	3.5	4.25	17	7	2.5	NE	3	4475 - 4476	Regen, S, 1, 5, B	--	Traveling with L16 and L17. Seems like the largest of the 3, deepest sinking depth.
3SAB_L19_4/2	46.37317	-68.15337	3.25	3.75	15	5.5	--	E	3	4477 - 4480	Mature, S, 1, 5, A	--	Melted out a bit, but seems small.
3SAB_L20_4/2	46.34404	-68.15544	3.5	4	17	6.5	0.5	S	4	4482 - 4484	Mature, S, 2, 4, B	--	Regen to the east.
3SAB_L21_4/2	46.34274	-68.04537	3.5	4	16	6	2.5	E	2	4505 - 4509	Regen, SH, 1, 5, A	--	Really melted out, bet seems to be a large lynx.