

**2014 Deer Wintering Area  
Habitat Assessment Report,  
Number Nine Wind Project**

Aroostook County, Maine



Prepared for:  
EDP Renewables North America  
134 N. LaSalle Street, Suite 2050  
Chicago, IL 60602

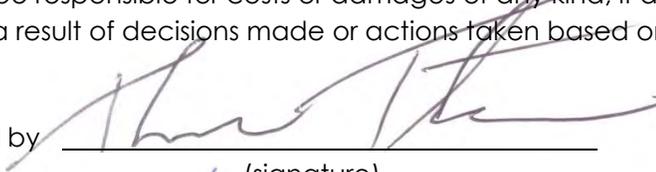
Prepared by:  
Stantec Consulting Services Inc.  
30 Park Drive  
Topsham, ME 04086

May 2014

## Sign-off Sheet

This document entitled 2014 Deer Wintering Area Habitat Assessment Report, Number Nine Wind Project was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of EDP Renewables North America (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

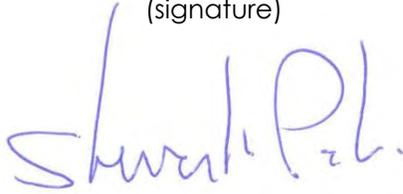
Prepared by



(signature)

**Thomas Tetreau**

Reviewed by



(signature)

**Steven Pelletier**

## Table of Contents

<b>1.0</b>	<b>INTRODUCTION AND PROJECT BACKGROUND</b> .....	<b>1</b>
<b>2.0</b>	<b>SURVEY METHODOLOGY</b> .....	<b>1</b>
<b>3.0</b>	<b>SURVEY RESULTS AND DISCUSSION</b> .....	<b>2</b>
3.1	HAYNESVILLE DWA (#100068) .....	2
3.2	HAYNESVILLE DWA (#100075) .....	3
<b>4.0</b>	<b>SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</b> .....	<b>4</b>
<b>5.0</b>	<b>LITERATURE CITED</b> .....	<b>5</b>

### LIST OF TABLES

Table 1.	DWA Survey Summary, Number Nine Wind Project, 2014. ....	5
----------	----------------------------------------------------------	---

### LIST OF FIGURES

- Figure 1. Generator Lead South Natural Resources
- Figure 2. Number Nine Deer Wintering Area Survey
- Figure 3. Number Nine Deer Wintering Area Survey

### LIST OF APPENDICES

#### APPENDIX A REPRESENTATIVE PHOTOGRAPHS

May 2014

## 1.0 INTRODUCTION AND PROJECT BACKGROUND

EDP Renewables (EDPR) contracted Stantec Consulting Services, Inc. (Stantec) to assess mapped Deer Wintering Areas (DWAs) in the vicinity of the proposed Number Nine Wind Project (project) in Aroostook County, Maine. This report describes the methods and results of that effort.

The project will include a generator lead that extends from the turbine locations approximately 45-miles south to a substation in Haynesville. The proposed generator lead corridor includes a 25-mile segment from Houlton to Haynesville known as the Bridal Path. Most of this corridor was cleared approximately 50 years ago but the electrical transmission line was never constructed. Remnants of the 150-foot wide cleared corridor are evident where the corridor traverses through maturing forested stands but generally indistinguishable where timber harvests have occurred within the last 10–20 years. Portions of the Bridal Path corridor, including sections near roadways, and the east and west branches of the Mattawamkeag River were not previously cleared.

The proposed generator lead will intersect portions of two Deer Wintering Areas (DWAs) that have been identified and mapped by the Maine Department of Inland Fisheries and Wildlife (MDIFW) along the Bridal Path in Haynesville (Figure 1). These two DWAs include:

- Haynesville, MDIFW DWA #100068 (Figure 2);
- Haynesville, MDIFW DWA #100075 (Figure 3);

DWAs provide important refuge for white-tailed deer (*Odocoileus virginianus*) during the winter months in northern climates (Moen 1968, Moen 1976, MDIFW 1990, Lavigne 1999) and are both identified and regulated by the Maine Department of Inland Fisheries and Wildlife (MDIFW) under the Maine Natural Resources Protection Act (38 MRSA §480). 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*), balsam fir (*Abies balsamea*), or red spruce (*Picea rubens*), as well as forested wetlands dominated by eastern arborvitae (*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 typically congregate or “yard-up” within these areas to take advantage of shallower snow depths, thus allowing for more efficient travel for foraging and avoiding predators, as well as thermal protection from wind chill.

## 2.0 SURVEY METHODOLOGY

In April 2014, Stantec conducted habitat assessments within portions of the two DWAs in Haynesville that are intersected by the proposed generator lead. Prior to these assessments, Stantec met with MDIFW on March 5, 2014 to discuss the proposed surveys. A follow-up

May 2014

conversation was had with Regional Biologist Rich Hoppe on April 14 once landowner access permission was provided by EDPR to discuss the applicability of the late winter snow conditions. Mr. Hoppe advised that deteriorating snow conditions may be an issue. A decision was made to assess conditions upon arrival in the field and to then conduct the work if there were appropriate conditions (see below). Follow-up pellet count surveys would then be conducted before leaf out as a back-up to the assessment.

Transects were established along the proposed centerline of the generator lead, 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. Field surveys were conducted during appropriate deer wintering ground conditions as outlined in the MDIFW DWA and Travel Corridor (December 22, 1993) guidance document. Snow depth and weather conditions were recorded at each DWA. 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.

### 3.0 SURVEY RESULTS AND DISCUSSION

Surveys were conducted on April 14, 2014 and April 15, 2014. The following sections, including Table 1, summarize the results of the field surveys and present a characterization of the existing forest conditions within each DWA in the vicinity of the proposed generator lead. Representative photographs are included in Appendix A.

Snow conditions were similar for each DWA. Snow depth averaged from 24–30 inches in open, hardwood areas and 20–24 inches in areas with a closed canopy. Sinking depth ranged from 1–12 inches from the surface of the snow. When snow depth exceeds 12 inches, deer will typically leave hardwood areas and seek shelter in the closed canopy and decreased snow depth found in closed canopies. Deer will concentrate in the areas of best shelter within the DWAs and utilize established trails when sinking depth exceeds 18 inches. Due to the late timing of the field surveys, temperatures were above the maximum average daily temperature of 32 degrees Fahrenheit as outlined in the MDIFW DWA and Travel Corridor guidance document. Daily temperatures during the field surveys ranged from 40 degrees Fahrenheit in the mornings to 55 degrees Fahrenheit in the afternoons. Despite the limitations of the late season survey, the harsh winter conditions experienced from December 2013 through March 2014 continued to influence the eastern Maine region, revealing continued deer use of the DWAs.

#### 3.1 HAYNESVILLE DWA (#100068)

On April 14 and 15, 2014, Stantec completed surveys within the MDIFW-mapped DWA (#100068) in Haynesville. Seven transects and 345 plots were established within a 0.25-mile zone in the vicinity of the proposed generator lead within the DWA between Sweden Road and Bellfield

May 2014

Road, on the north and south sides of the West Branch of the Mattawamkeag River (Figure 2). Field survey results indicate that 145 of the plots (42%) contained conforming DWA canopy cover (e.g., stands with tree heights 35 feet or taller and canopy closures of more than 50%). Twenty-one (6%) of the plots contained evidence of deer use. Portions of the transects located near the West Branch of the Mattawamkeag River contained the highest proportion of suitable DWA forest cover and are presently characterized by a dense forest canopy dominated by eastern arborvitae (*Thuja occidentalis*), eastern hemlock, red spruce, and yellow birch (*Betula alleghaniensis*). Past timber harvests and the creation of a logging road that extends west and south from Bellfield Road have occurred within the last 2–3 years at the northern ends of transects 1-1, 1-2, 1-4, and 1-6. These areas are presently characterized by an open canopy forest with many strip cuts and skidder trails dominated by residual red spruce, yellow birch, and sugar maple (*Acer saccharum*) trees with red maple (*Acer rubrum*), striped maple (*Acer pennsylvanicum*), and quaking aspen (*Populus tremuloides*) shrubs and saplings within the forest understory. Dense regeneration of balsam fir is interspersed throughout the harvested forest areas.

Within the proposed generator lead corridor (transect 1-1), 20 of the 55 plots (36%) surveyed presently contain suitable softwood forest cover, and 9 plots (16%) contained evidence of deer use. The proposed corridor will create an open corridor through the DWA. However, much of the generator lead will be located in areas that have been previously affected by past timber harvests and 35 of the 55 plots (64%) do not presently contain suitable DWA canopy cover. The highest concentration of conforming canopy cover that will be removed as part of the project occurs in the vicinity of the West Branch of the Mattawamkeag River.

### 3.2 HAYNESVILLE DWA (#100075)

On April 15, 2014, Stantec completed surveys within the Haynesville MDIFW-mapped DWA (#100075), which is located west of Route 2A and on the north and south sides of Babcock Road. The southern edge of the DWA is located south of Alder Brook (Figure 3). Eight transects and 142 plots were established within a 0.25-mile zone in the vicinity of the proposed generator lead within the DWA. Of the plots, 80 (56%) contained conforming DWA canopy cover. Eighty-five (60%) of the plots contained evidence of deer use. Portions of transects 2-1, 2-3, 2-5, and 2-7 north of Babcock Road have been recently harvested for timber in the last 1 or 2 months. These areas are presently characterized by primarily open canopy softwood forests dominated by sparse stands of balsam fir and red spruce with recent strip cuts and skidder trails. Deer use was observed throughout the recently harvested area due to deer feeding on the fresh cut tops and limbs scattered on the ground. The existing Maine Eastern Power Company (MEPCO) transmission line intersects the southeast portion of the DWA. Transects west of the proposed generator lead and south of Babcock Road are less disturbed by past timber harvests and contain the highest proportion of suitable DWA forest cover. They are presently characterized by closed canopy softwood forests dominated by large stands of red spruce, balsam fir, and eastern arborvitae.

May 2014

Within the proposed generator lead corridor (transect 2-1), 5 of the 19 (26%) plots surveyed presently contain suitable softwood forest cover, and 4 (21%) plots contained evidence of deer use. The proposed generator lead will create an open corridor through the center of the DWA. The majority of the proposed generator lead corridor north of Babcock Road has been recently harvested for timber that has resulted in limited suitable softwood cover. Because this transect follows the Bridal Path, the forest cover differs from the surrounding transects. Two of the 7 plots within this transect south of Babcock Road contained suitable softwood cover with no evidence of deer use. Other than transect 2-5, which is impacted most by recent timber harvests (20% conforming cover), the transect along the proposed centerline (transect 2-1) had the lowest amount of conforming cover. Combined, the remaining 6 transects within the DWA contained 72 of 108 plots (67%) with conforming cover.

### 4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The two DWAs evaluated by Stantec in April 2014 appear to vary in their function as DWAs. Past timber management activities in the Haynesville DWA (#100068) have removed suitable softwood stands and fragmented travel corridors with logging roads and skidder trails. However, the forested areas adjacent to the north and south sides of the West Branch of the Mattawamkeag River are relatively undisturbed and provide effective winter cover and travel corridors for deer along the river. The proposed generator lead crossing of this DWA will be located along the Bridal Path which will limit removal of suitable softwood cover. Its location near the center of the DWA could result in habitat fragmentation and limit deer movement throughout the DWA unless measures are implemented to mitigate these impacts. These efforts could include utilizing taller poles and alternative clearing techniques (V-notch cutting, narrower clearing limits) for the retention of forested cover within the corridor, which may in turn provide better conditions for movement of deer across the corridor during winter, especially along the west branch of the Mattawamkeag River.

The Haynesville DWA (#100075) has been impacted by recent timber management activities which removed suitable softwood cover along the proposed generator lead to the north of Babcock Road. The less disturbed forests south of Babcock Road provide effective winter cover and travel corridors for deer between Babcock Road and Alder Brook. The proposed generator lead crossing of this DWA will be located along the Bridal Path which will limit removal of suitable softwood cover. The majority of the mapped DWA is located west of the 0.25-mile study area around the proposed generator lead corridor. Although this area was not surveyed, there appears to be better and more contiguous habitat on both sides of Alder Brook, extending to the Glenwood Plantation town line. This area is also less disturbed by recent timber harvesting activities. The proposed generator lead location in the DWA could result in habitat fragmentation and limit deer movement throughout the DWA unless measures are implemented to mitigate these impacts. These efforts could include utilizing taller poles and alternative clearing techniques (V-notch cutting, narrower clearing limits) for the retention of forested cover

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

May 2014

within the corridor, which may in turn provide better conditions for movement of deer across the corridor during winter, especially in the area between Babcock Road and Alder Brook.

**Table 1.** DWA Survey Summary, Number Nine Wind Project, 2014.

DWA Name	Proportion of Suitable Softwood DWA Shelter within Proposed Corridor	Evidence of Deer Use within the Proposed Corridor	Comments
Haynesville (#100068)	20 of 55 (36%)	9 plots	Proposed corridor is located along the Bridal Path, intersecting the DWA and crossing the West Branch of the Mattawamkeag River.
Haynesville (#100075)	5 of 19 plots (26%)	4 plots	Proposed corridor is located near the eastern edge of the DWA along the Bridal Path, ending just north of Alder Brook.

## 5.0 LITERATURE CITED

Lavigne, G.R. 1999. White-tailed deer assessment and strategic plan 1997. Maine Department of Inland Fisheries and Wildlife, Augusta, ME. 134 pp.

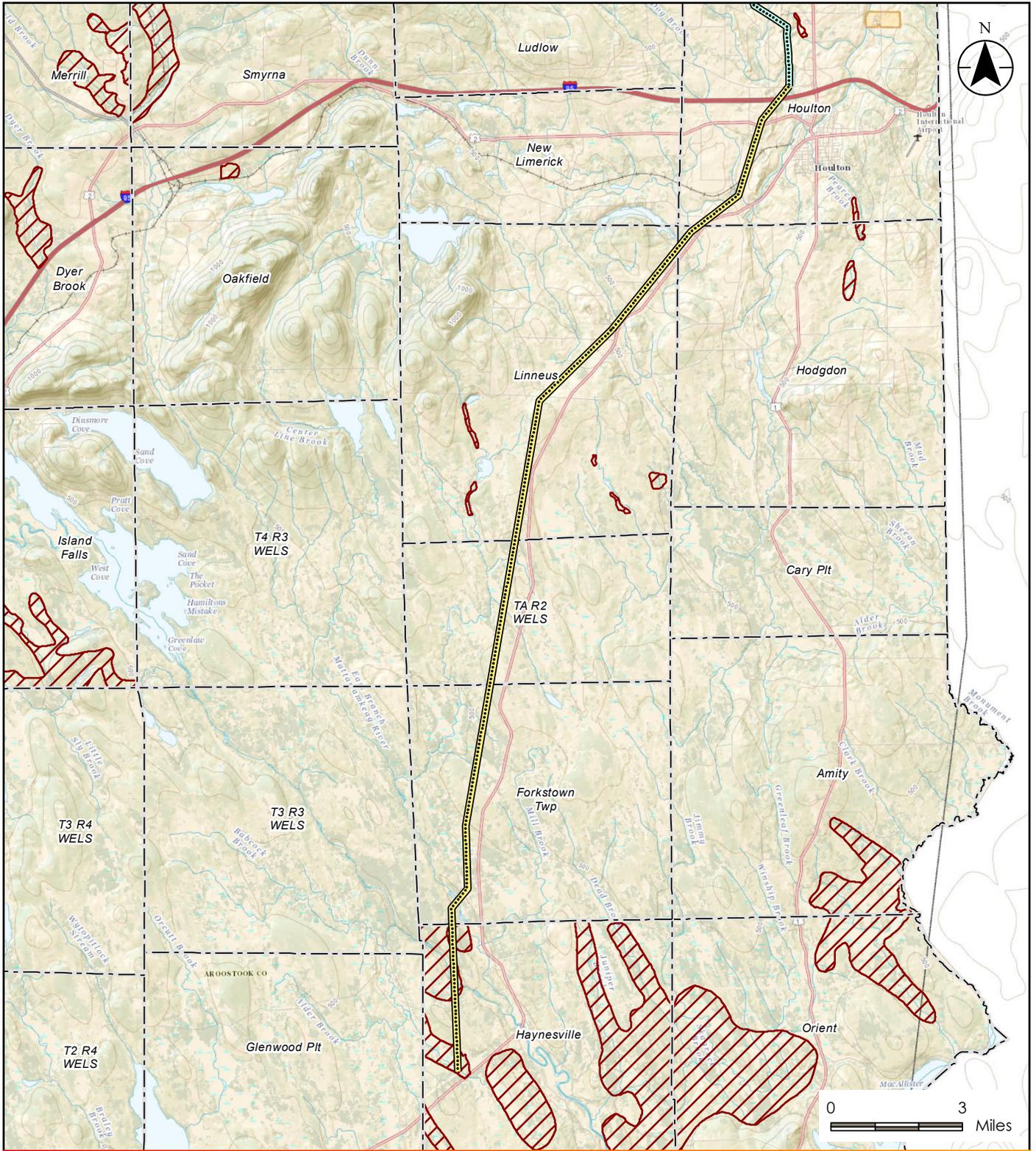
Maine Department of Inland Fisheries and Wildlife. 1990. Deer habitat management system and database. Maine Department of Inland Fisheries and Wildlife, Augusta, ME. 67 pp.

Moen, A.N. 1968. Energy exchange of white-tailed deer, western Minnesota. *Ecology*. 49: 676-682.

Moen, A.N. 1976. Energy conservation by white-tailed deer in the winter. *Ecology*. 57:192-198.

May 2014

## Figures



Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

195600919



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

00919\_001\_NatResBridalPath.mxd

Legend

-  Generator Lead South 345kV
-  Generator Lead North 345kV
-  MDIFW/LUPC Deer Wintering Area
-  Township Boundary

Client/Project

Number Nine Wind Project  
 Aroostook County, Maine

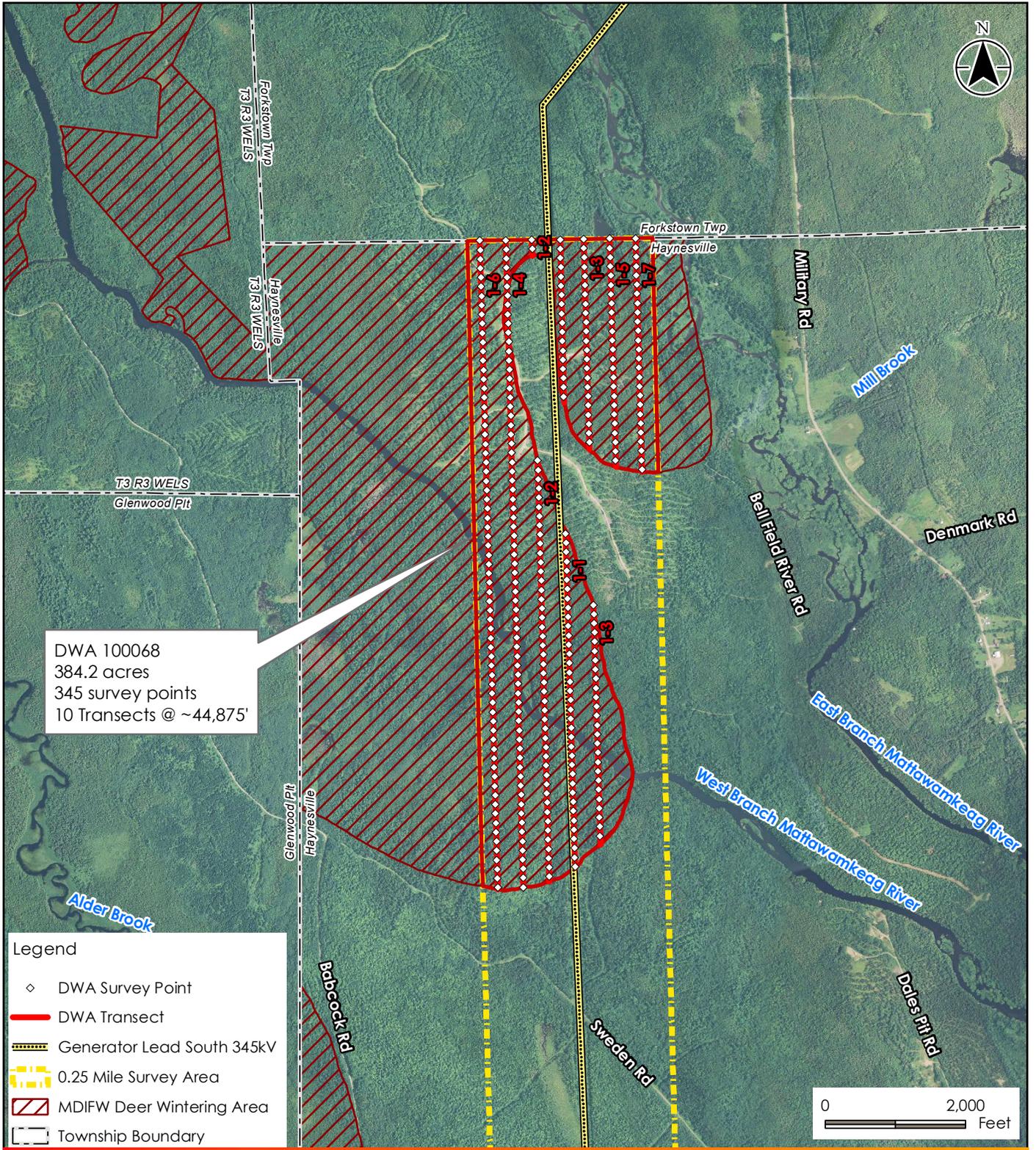
Figure No.

1

Title

Generator Lead South  
 Natural Resources

9/10/2014



DWA 100068  
 384.2 acres  
 345 survey points  
 10 Transects @ ~44,875'

**Legend**

- ◇ DWA Survey Point
- DWA Transect
- Generator Lead South 345kV
- 0.25 Mile Survey Area
- ▨ MDIFW Deer Wintering Area
- Township Boundary

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

195600919

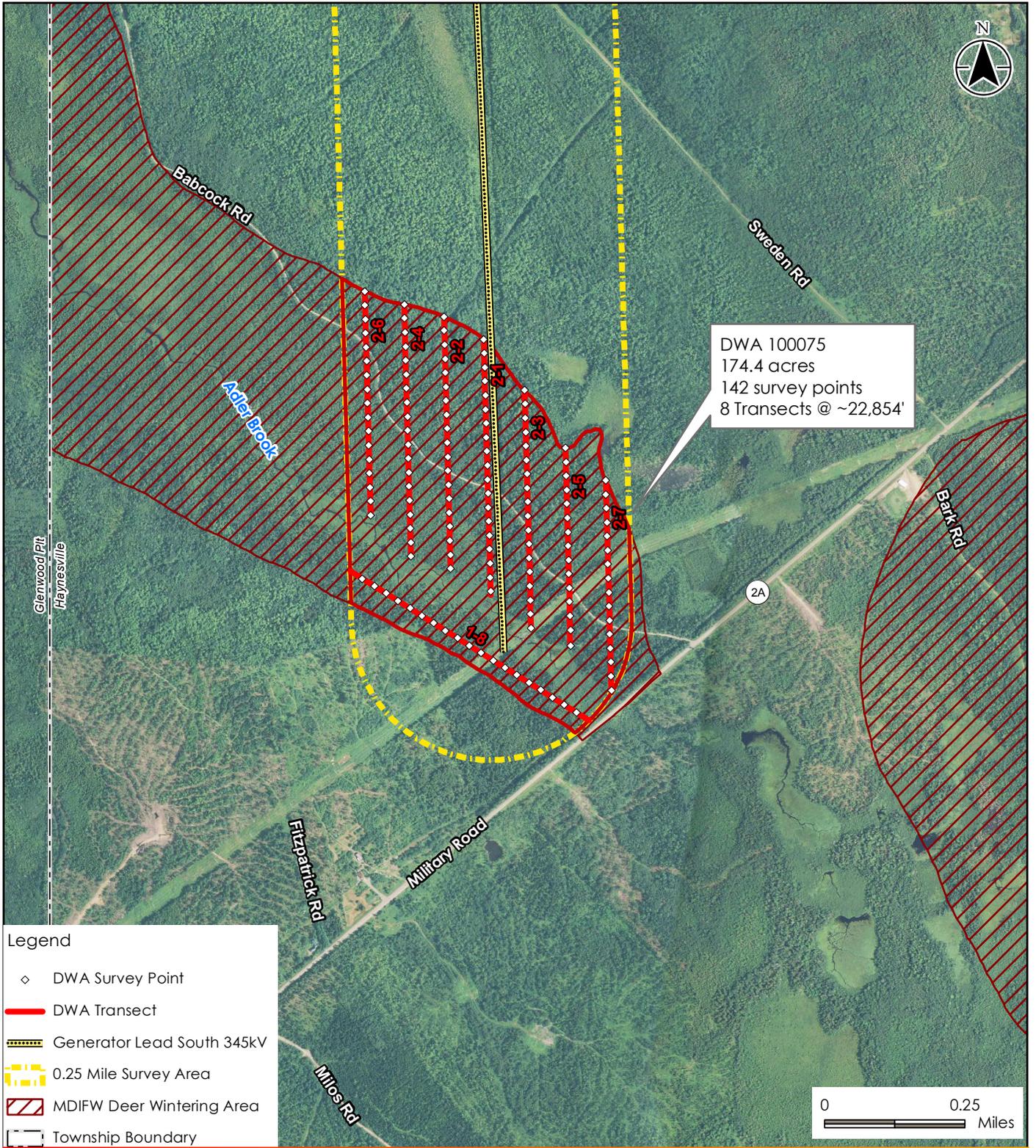


30 Park Drive  
 Topsham, ME USA 04086  
 Phone (207) 729-1199

**Client/Project**  
 Number Nine Wind Project  
 Aroostook County, Maine

**Figure No.**  
 2

**Title**  
 Number Nine  
 Deer Wintering Area Survey  
 9/10/2014



DWA 100075  
 174.4 acres  
 142 survey points  
 8 Transects @ ~22,854'

**Legend**

- ◊ DWA Survey Point
- DWA Transect
- Generator Lead South 345kV
- 0.25 Mile Survey Area
- ▨ MDIFW Deer Wintering Area
- - - Township Boundary

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

195600919



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

**Client/Project**  
 Number Nine Wind Project  
 Aroostook County, Maine

**Figure No.**  
 3

**Title**  
 Number Nine  
 Deer Wintering Area Survey  
 9/10/2014

April 2014

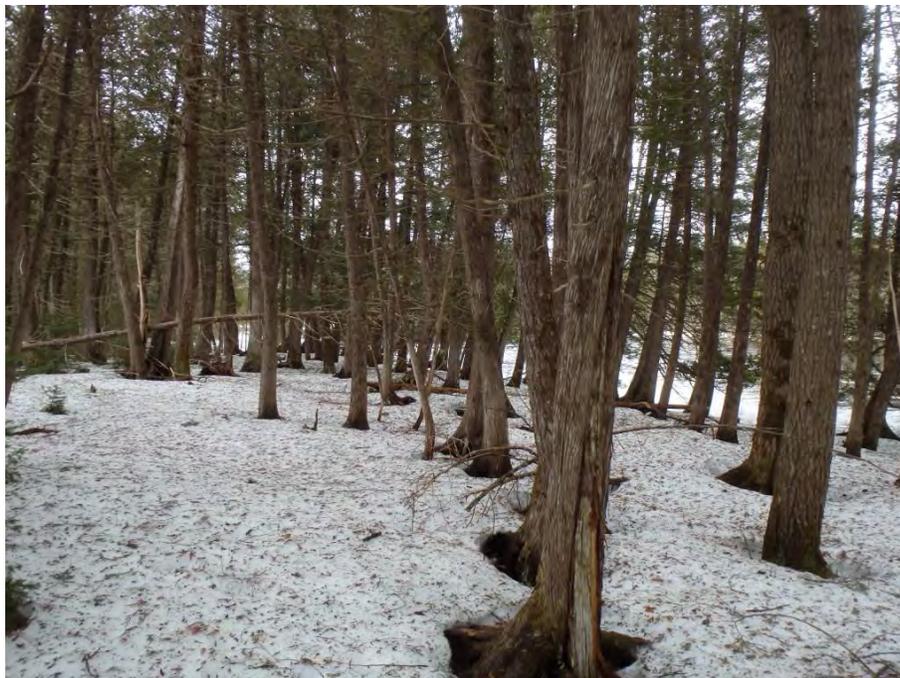
## Appendix A REPRESENTATIVE PHOTOGRAPHS

**2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT**

April 2014



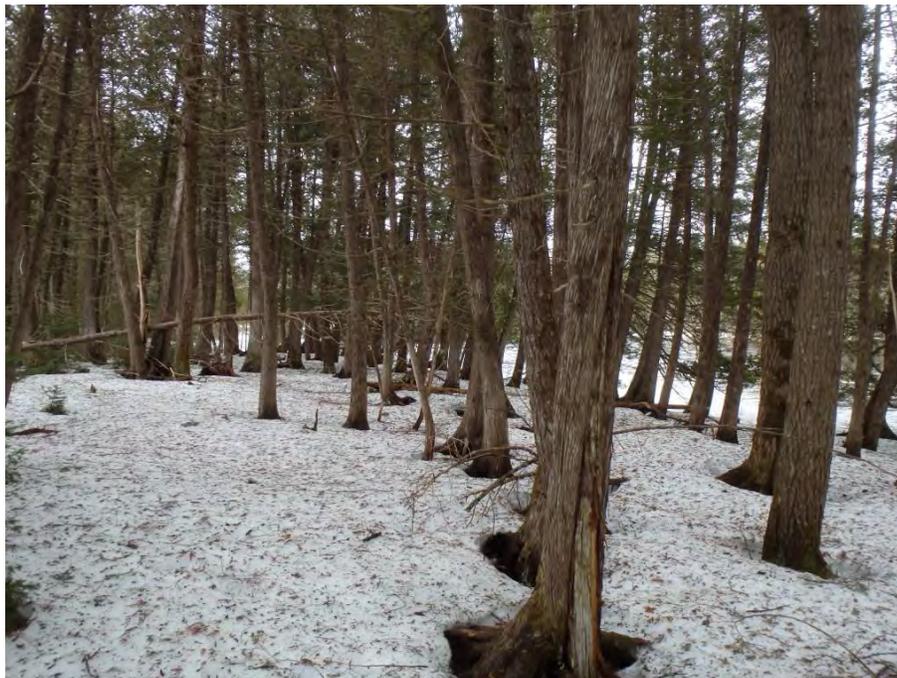
**Photo 1.** DWA 100068, Transect 1-1, Chain 55. SH2C cover along proposed generator lead corridor and Bridal Path. 4/14/14.



**Photo 2.** DWA 100068, Transect 1-1, Chain 42. S3A cover adjacent to the West Branch of the Mattawamkeag River. 4/15/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



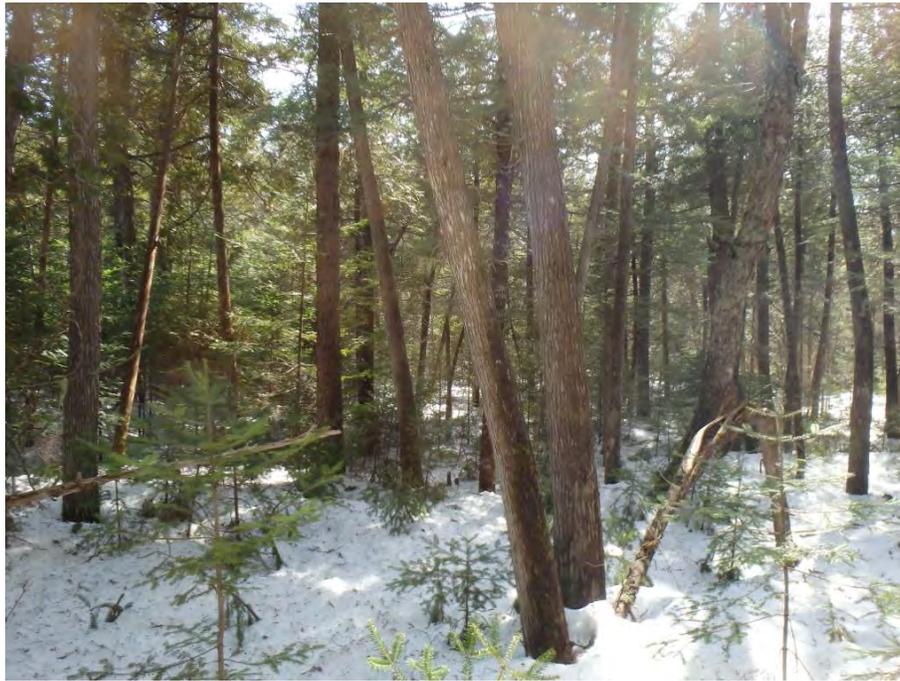
**Photo 3.** DWA 100068, Transect 1-1, Chain 42. S3A cover adjacent to the West Branch of the Mattawamkeag River. 4/15/14.



**Photo 4.** DWA 100068, Transect 1-2, Chain 5. S1C cover in harvested area near logging road. 4/14/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



**Photo 5.** DWA 100068, Transect 1-2, Chain 23. S3A cover north of the West Branch of the Mattawamkeag River. 4/14/14.



**Photo 6.** DWA 100068, Transect 1-2, Chain 30. SH3B cover and deer tracks near the north bank of the West Branch of the Mattawamkeag River. 4/14/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



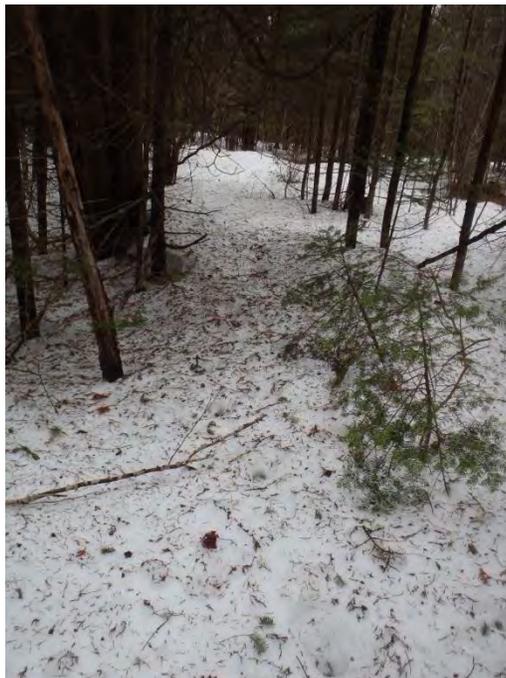
**Photo 7.** DWA 100068, Transect 1-2, Chain 38. S3A cover south of the West Branch of the Mattawamkeag River. 4/15/14.



**Photo 8.** DWA 100068, Transect 1-3, Chain 30. S2A cover north of the West Branch of the Mattawamkeag River. 4/14/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



**Photo 9.** DWA 100068, Transect 1-3, Chain 45. SH2B cover and deer trail south of the West Branch of the Mattawamkeag River. 4/15/14.



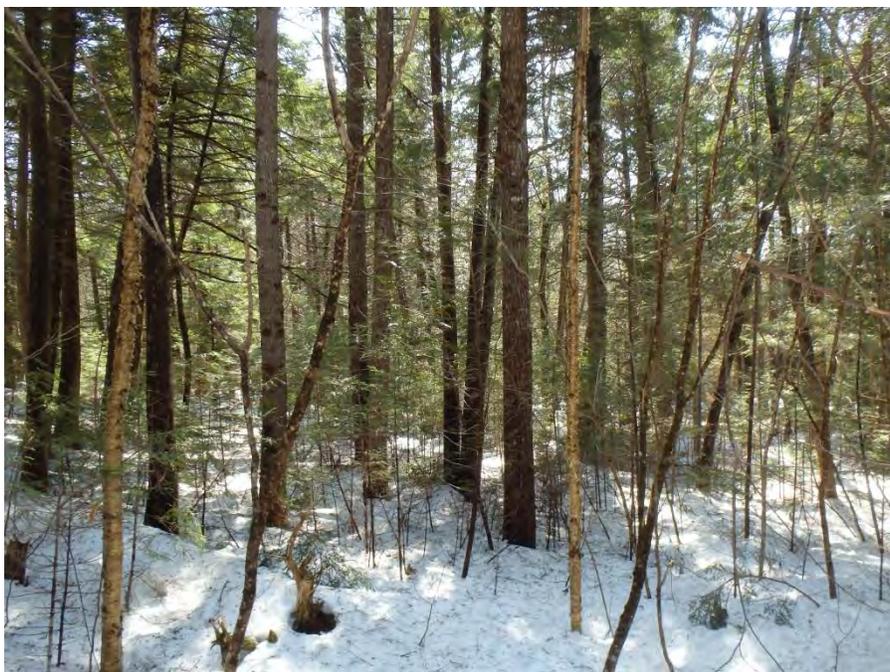
**Photo 10.** DWA 100068, Transect 1-4, Chain 29. S2C cover in dead cedar PFO. 4/14/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



**Photo 11.** DWA 100068, Transect 1-6, Chain 13. HS2C cover in harvested area near logging road west of proposed generator lead corridor. 4/14/14.



**Photo 12.** DWA 100068, Transect 1-6, Chain 34. S3A cover near north bank of the West Branch of the Mattawamkeag River. 4/14/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



**Photo 13.** DWA 100075, Transect 1-8, Chain 4. S2A cover south of Alder Brook. 4/15/14.



**Photo 14.** DWA 100075, Transect 1-8, Chain 8. S3A cover and pellet groups south of Alder Brook. 4/15/14.

## 2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT

April 2014



**Photo 15.** DWA 100075, Transect 2-3, Chain 10. Recent timber harvest north of Babcock Road. 4/15/14.



**Photo 16.** DWA 100075, Transect 2-5, Chain 8. Deer tracks and pellet groups in recent timber harvest area north of Babcock Road. 4/15/14.

**2014 DEER WINTERING AREA HABITAT ASSESSMENT REPORT, NUMBER NINE WIND PROJECT**

April 2014



**Photo 17.** DWA 100075, Transect 2-7, Chain 9. Recent timber harvest north of Babcock Road. 4/15/14.