



**NORTHLAND
POWER**

Rideau Lakes Solar Project

Draft Natural Heritage Evaluation of Significance Report

December 22, 2010



Northland Power Inc.
on behalf of
Northland Power Solar
Rideau Lakes L.P.
Toronto, Ontario

DRAFT Natural Heritage
Evaluation of Significance

Rideau Lakes Solar Project

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Project Report

December 22, 2010

**Northland Power Inc.
Rideau Lakes Solar Project**

DRAFT Natural Heritage Evaluation of Significance

Table of Contents

1. Introduction	3
1.1 Project Description	3
1.2 Legislative Requirements	3
1.2.1 Records Review Report	3
1.2.2 Site Investigation Report	4
1.2.3 Evaluation of Significance Report	4
1.3 Evaluation of Significance Report Format	4
2. Summary of Results of Records Review and Site Investigation.....	7
3. Wildlife Habitat	7
3.1 Evaluation Criteria and Guidelines for Wildlife Habitat, and Determination of Significance	7
3.1.1 Specialized Habitat for Wildlife.....	8
3.1.1.1 Habitat for Savannah Sparrow, an Area-Sensitive Species	8
3.1.1.2 Habitat for Ovenbird, an Area-Sensitive Species	8
3.1.1.3 Old-Growth Forest	9
3.1.1.4 Highly Diverse Areas.....	10
3.1.2 Habitat for Species of Conservation Concern.....	10
3.1.3 Animal Movement Corridors	12
3.1.4 Overall Evaluation.....	12
3.2 Date of Beginning and Completion of Evaluation	13
3.3 Name and Qualifications of Evaluator	13
4. Woodlands	13
4.1 Description of Natural Feature	13
4.2 Evaluation Criteria and Guidelines for Woodlands	14
4.3 Date of Beginning and Completion of Evaluation	15
4.4 Determination of Significance	15
4.5 Name and Qualifications of Evaluator	15
5. Conclusions.....	15
6. References.....	16

List of Tables

Table 2.1	Natural Features on and within 120 m of the Project Location.....	7
Table 5.1	Significant Natural Features on and within 120 m of the Project Location.....	15

List of Figures

Figure 1.1	Project Location and Natural Heritage Features	5
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1. Introduction

1.1 Project Description

Northland Power Solar Rideau Lakes L.P. (hereinafter referred to as “Northland”) is proposing to develop a 10-megawatt (MW) solar photovoltaic project titled the Rideau Lakes Solar Project (hereinafter referred to as the “Project”). The Project will be located on approximately 50 hectares (ha) of land, located in the Township of Rideau Lakes, within the United Counties of Leeds and Grenville (Figure 1.1).

1.2 Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. Ground-mounted solar facilities with a nameplate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require an REA in accordance with Section 4 of O. Reg. 359/09.

Section 24 (1) of O. Reg. 359/09 requires proponents of Class 3 solar projects to undertake a natural heritage assessment consisting of a records review report, site investigation report and an evaluation of significance report for each natural feature identified during the records review and site investigation.

Natural features are defined in Section 1 (1) of O. Reg. 359/09 to be all or part of

- a) an area of natural and scientific interest (ANSI) (earth science)
- b) an ANSI (life science)
- c) a coastal wetland
- d) a northern wetland
- e) a southern wetland
- f) a valleyland
- g) a wildlife habitat, or
- h) a woodland.

1.2.1 Records Review Report

Section 25 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage records review to identify “whether the project is

- (a) in a natural feature
- (b) within 50 m of an area of natural and scientific interest (earth science)
- (c) within 120 m of a natural feature that is not an area of natural or scientific interest (earth science).” (O. Reg. 359/09, s. 25, Table).

Subsection 2 of Section 30 of the REA Regulation requires the proponent to prepare a report “setting out a summary of the records searched and the results of the analysis” (O. Reg. 359/09). The Natural Heritage Records Review Report (Hatch Ltd., 2010a) was prepared to meet these requirements.

1.2.2 Site Investigation Report

Section 26 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage site investigation for the purpose of determining

- whether the results of the analysis summarized in the (natural heritage records review) report prepared under Subsection 25 (3) are correct or require correction, and identifying any required corrections
- whether any additional natural features exist, other than those that were identified in the (natural heritage records review) report prepared under Subsection 30 (2)
- the boundaries, located within 120 m of the Project location, of any natural feature that was identified in the records review or the site investigation
- the distance from the Project location to the boundaries determined under clause (c).

The Natural Heritage Site Investigation Report (Hatch Ltd., 2010b) was prepared to meet these requirements.

1.2.3 Evaluation of Significance Report

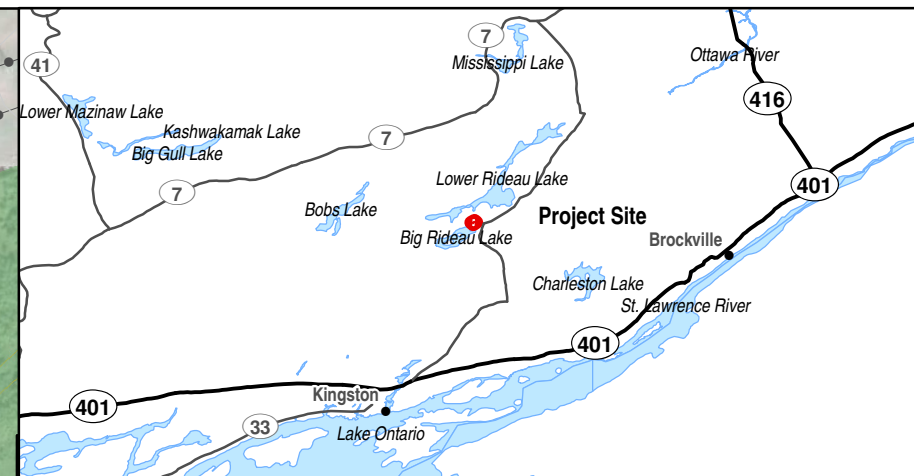
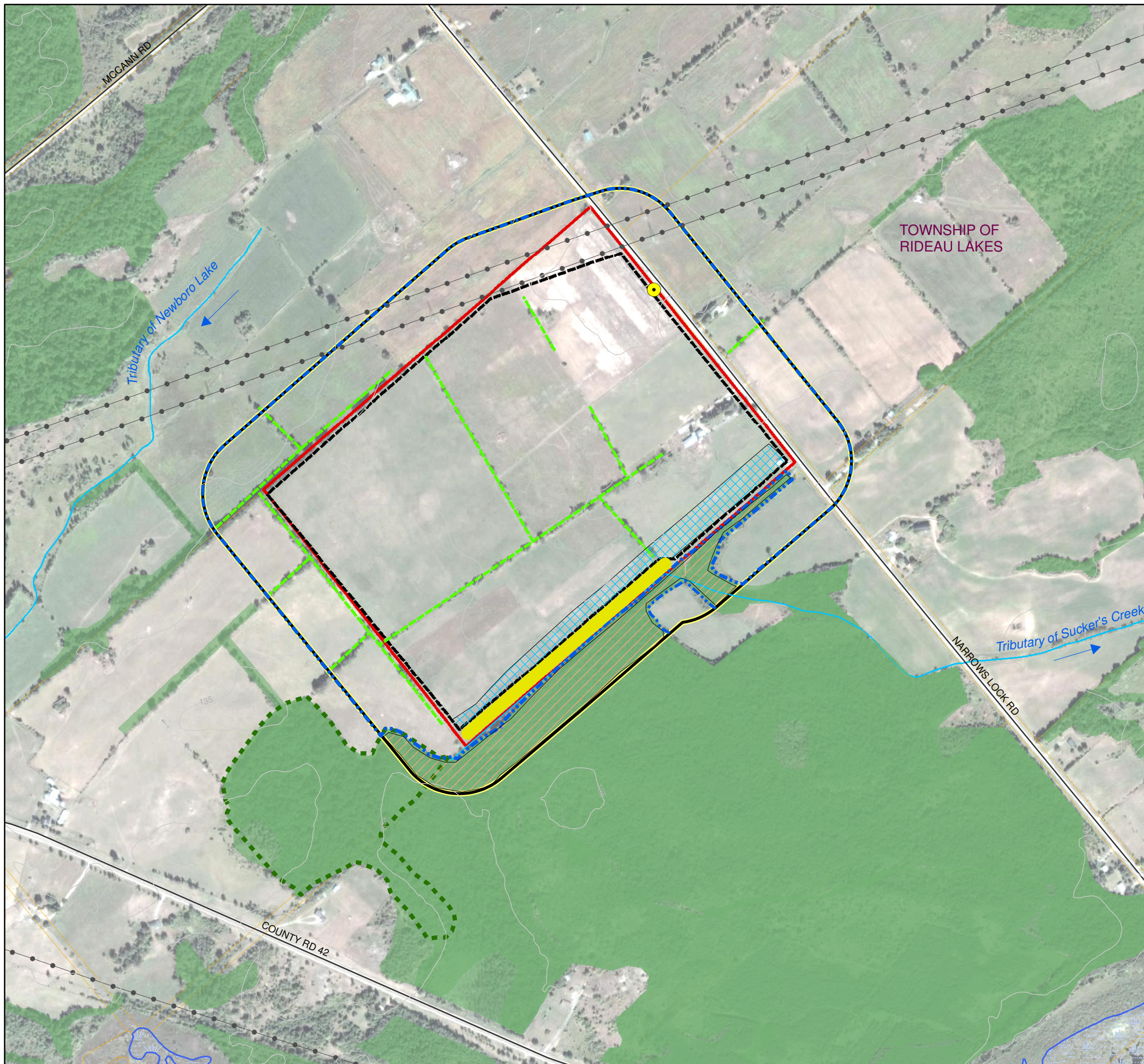
Section 27 of the REA Regulation requires proponents of Class 3 solar projects to undertake an evaluation of significance for natural heritage features identified during the records review and site investigation and prepare a report that sets out

- a determination of whether the natural feature is
 - ◆ provincially significant
 - ◆ significant
 - ◆ not significant
 - ◆ not provincially significant
- a summary of the evaluation criteria or procedures used to make the determinations
- the name and qualifications of any person who applied to evaluation criteria or procedures.

This Evaluation of Significance (EOS) Report for the natural features identified within 120 m of the Project has been prepared to meet these requirements.

1.3 Evaluation of Significance Report Format

Section 1 of this EOS has identified the legislative requirements for an EOS under the REA Regulation and identified the reasons why an EOS is required for the Project. Section 2 provides a summary of the results of the records review and site investigation. Section 3 provides the evaluation of



Key Map

Legend

- Roads
- Transmission Line
- Topographic Contour (5m interval)
- Watercourse
- ▭ Available Lands
- ▭ 120m from Project Location
- ▭ Parcels

Candidate Significant Natural Heritage Features

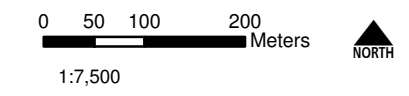
- ▭ Woodland

Candidate Significant Wildlife Habitat

- ▭ Hedgerow - Baltimore Oriole/Eastern Kingbird Habitat/
Animal Movement Corridor
- ▭ Old Growth Forest
- ▭ Savannah Sparrow Habitat
- ▭ Milksnake Habitat
- ▭ Ovenbird Habitat / Highly Diverse Areas / Animal Movement Corridor

Project Components

- Connection Point with Distribution Line
- ▭ Project Location
- ▭ 60 m Buffer from Woodland (Construction)
- ▭ Annual Vegetation Management Zone (Operations)



Notes:
 1. OBM and NRVIS data downloaded from LIO, with permission.
 2. Spatial referencing UTM NAD 83.
 3. Satellite imagery from Google Earth Pro.

Figure 1.1
 Northland Power Inc.
Rideau Lakes Solar Energy Project
Project Location and
Natural Heritage Features

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significance for wildlife habitat. Section 4 provides the evaluation for the woodland. Section 5 identifies the conclusions of the evaluation of significance, and the references are provided in Section 6.

2. Summary of Results of Records Review and Site Investigation

As stated above, natural features requiring an evaluation of significance are identified through the records review (Hatch Ltd., 2010a) and site investigation (Hatch Ltd., 2010b) required under Sections 25 and 26 of the REA Regulation, respectively. These studies have already been completed, and the results are summarized in Table 2.1. This report provides the evaluations for the features identified in Table 2.1.

Table 2.1 Natural Features on and within 120 m of the Project Location

Natural Feature	Project Location	Adjacent Lands (within 120 m)	Notes
ANSI – Earth Science	No	No	
ANSI – Life Science	No	No	
Wetland	No	No	
Wildlife Habitat	Yes	Yes	Candidate significant wildlife habitats were identified both on and within 120 m of the Project location
Woodland	No	Yes	There is a woodland located within 120 m south of the Project location.
Valleyland	No	No	

3. Wildlife Habitat

Four types of candidate significant wildlife habitats were identified during the site investigation:

- animal movement corridors
- habitat for species of conservation concern (Milksnake)
- habitat for area-sensitive species (Savannah Sparrow, Ovenbird)
- specialized habitat for wildlife present within the woodland (old-growth forest, highly diverse area).

3.1 Evaluation Criteria and Guidelines for Wildlife Habitat, and Determination of Significance

The criteria and processes outlined in the Ministry of Natural Resources (MNR) Natural Heritage Reference Manual (NHRM) (MNR, 2010a) and Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) are used to evaluate the significance of wildlife habitat. The specific criteria used in the evaluation from these sources are discussed by habitat type below.

3.1.1 *Specialized Habitat for Wildlife*

Criteria for evaluation of specialized habitat for wildlife are identified within Table Q-2 of Appendix Q of the SWHTG. The criteria that were considered during the evaluations of the features are discussed in respect of the individual features below.

3.1.1.1 *Habitat for Savannah Sparrow, an Area-Sensitive Species*

The criteria for area-sensitive grassland species include the following:

- Presence of rare, uncommon, or declining species – Savannah Sparrow populations are believed to be declining as a result of reductions in grassland habitats associated with reforestation, intensification of agriculture, and development within the province (Ontario Partners in Flight, 2005). Therefore, this criteria is met.
- Overall area of the site/current representation of the specialized habitat – Based on satellite imagery, there are several large contiguous areas of grassland present within the regional area (approximately 420 ha within 1 km of the Project location); therefore, this site (which encompasses approximately 44 ha), represents slightly more than 10% of the available grasslands within 1 km of the Project location. Further, given that Savannah Sparrow commonly nest beside roadways, it is expected that once ground cover becomes established following construction, suitable habitat will remain present on the Project location during the operations period. As a result, this criteria is not met.
- Amount of vertical stratification of site – No vertical stratification was noted during the site investigation within the grassland. Therefore, this criteria is not met.
- Degree of disturbance – Site is a pastureland/hayfield that is harvested annually, and not in an early stage of succession. Therefore, this criteria is not met.
- Amount of adjacent residential development – There is no true residential development in the area. Therefore, this criteria is met.
- Provision of significant wildlife habitat – The only other significant wildlife habitat characteristic of this area is potential general use habitat for Milksnake (see Section 3.1.2). Therefore, this criteria is not met as several significant wildlife habitats were not noted.
- Potential for long-term protection of the site – The site is located on private land, and therefore, long-term protection of the feature cannot be assured, though long-term protection will be provided by Northland throughout the period of time which they are present on the Project location.

Though two of the criteria are met, these criteria simply apply to the presence of the species and adjacent development, and do not truly provide an indication as to the overall value of the site to Savannah Sparrow. Based on the abundance of this habitat type in the area, the expected availability of habitat on the Project location following construction, and the level of disturbance present within the suitable habitat, this feature is determined to not meet the criteria for significance.

3.1.1.2 *Habitat for Ovenbird, an Area-Sensitive Species*

The criteria for area-sensitive woodland species include the following:

- Presence of rare, uncommon, or declining species – Ovenbird populations are believed to be stable within this portion of the Province; declines in probability of observation in the Ontario Breeding Bird Atlas were restricted to the Carolinian region of the province (Burke, 2005). Therefore, this criteria is not met.
- Overall area of the site/current representation of the specialized habitat – Large areas of old-growth forest, such as that found south of the Project location, are somewhat uncommon within the region. Therefore, this criteria is met.
- Amount of vertical stratification of site – A well-developed understory/herbaceous layer was noted within the woodland during the site investigation, resulting in vertical stratification. As a result, this criteria is met.
- Degree of disturbance – The woodland is generally undisturbed, with limited evidence of use. Surrounding areas consist of residences, agricultural operations, and roadways. Therefore, this criteria is met.
- Amount of adjacent residential development – There is no true residential development in the area. Therefore, this criteria is met.
- Provision of significant wildlife habitat – Other significant wildlife habitat characteristics of this woodland are its classification as an old-growth forest as well as potential habitat for species of conservation concern (see Section 3.1.2). Therefore, this criteria is met as several significant wildlife habitats were not noted.
- Potential for long-term protection of the site – The site is located on private land, and therefore, long-term protection of the feature cannot be assured. Therefore, this criteria is not met.

As a result of the several criteria that have been met, this woodland is considered to be significant wildlife habitat for Ovenbird.

3.1.1.3 *Old-Growth Forest*

The criteria for old-growth forest include the following:

- Current representation within the planning area – This value is unknown; however, it is anticipated that old-growth forests are relatively uncommon within the landscape, and therefore, this criteria is met.
- Age/age classes of trees – Age/age classes of trees within the woodland is unknown.
- Presence of old growth characteristics – Several fallen logs were noted within the woodland at various stages of decomposition. Variation in tree size, and uneven canopy height was noted within the woodland.
- Species diversity – The woodland was determined to be dominated by maples, with American Basswood, and Trembling Aspen associates.
- Provision of significant wildlife habitat – The woodland provides significant wildlife habitat for Ovenbird, an area sensitive species, as well as potential habitat for two species of conservation concern.

- Potential for long-term protection of site – The woodland is located on private land, and therefore, long-term protection cannot be assured.
- Stand history – Based on site investigation, there is no evidence of substantial logging or forestry activities within the woodland.
- Size and location of site – The portion of old growth forest is greater than 10 ha, and is connected to other natural areas (such as wetlands and waterbodies).
- Degree of disturbance – Degree of disturbance within the interior of the woodland is light.

Therefore, several of the criteria are met, and this woodland is considered to provide significant old-growth forest habitat.

3.1.1.4 *Highly Diverse Areas*

The criteria for areas of high diversity include the following:

- Current representation of such areas in the planning area – This value is unknown, however, through woodlands represent between 30 and 60% of the landscape within eastern Ontario, the majority are located away from the Frontenac Axis and therefore this criteria is assumed to be met.
- Natural community diversity – Several different forest types were not noted within the woodland community. The community was identified as consistent throughout with the exception of plantations in the southern extent of the location.
- Species diversity – A complete species inventory of the community was not completed as only a small portion of the woodland falls within 120 m of the Project location. Within 120 m of the Project location, common vegetation species observed included American Basswood, maples, Trembling Aspen, and black cherry, while Ovenbird were recorded singing from the woodland. As a result species diversity within 120 m is described as moderate. Given the large size of the woodland, it is expected that a diverse wildlife community is present given the availability of both forest interior and edge habitats, as well as immature and old growth forest communities. Therefore, this criteria is met.
- Presence of rare species – No rare species were detected during the site investigation. Therefore, this criteria is not met.
- Size of site – Woodland size was determined to be 62 ha, which is a large woodland, and therefore this criteria is met

Based on the above evaluation, several criteria for significance were met and the woodland is considered to be a highly diverse area.

3.1.2 *Habitat for Species of Conservation Concern*

Criteria for evaluation habitat of conservation concern are identified within Table Q-3 of Appendix Q of the SWHTG. The criteria that were considered during this evaluation include

- degree of rarity of species found at site (i.e., habitat of rare species is significant)

- documented significant decline in a species and/or its critical habitat
- species whose range is solely or primarily found in Ontario
- condition of existing habitat at site (i.e., sites with minimal disturbance, non-invasive sp., etc)
- size of species population at site
- size and location of habitat
- potential for long-term protection of habitat
- evidence of use of the habitat.

Species of conservation concern are discussed separately below.

- Savannah Sparrow – Previously addressed in Section 3.1.1.1. Given the abundance of habitat in the area, habitat for this species is not considered to be significant.
- Woodland Edge/Hedgerow Species – Confirmed breeding habitat for Baltimore Oriole and Eastern Kingbird was noted for these species within the hedgerows of the Project location. Neither of these species are considered to be rare species, however both are identified as undergoing declines within the province (Ontario Partners in Flight, 2006). Neither species range is solely or primarily found within Ontario. Habitat conditions within the hedgerows were considered to be of poor quality (sparsely populated with predominantly short tree height). A single breeding pair of each species was confirmed as occurring on or within 120 m of the Project location during the site investigation. Both Baltimore Orioles and Eastern Kingbird are described as exhibiting strong fidelity to breeding sites. Baltimore Orioles home ranges vary from 0.6 to 1.5 ha, with average distance between breeding locations in a given year determined to be 100 m (Rising and Flood, 1998). Eastern Kingbird home ranges average 8 ha, though no information on year-to-year separation of breeding locations is available (Murphy, 1996). During the site investigation, Baltimore Orioles were recorded within the hedgerow in the northwest corner, which extends west and north of the Project location, while Eastern Kingbirds were recorded in the southern half of the western hedgerow. Suitable alternate breeding habitat is found within the home ranges adjacent to where these individuals were observed. The site is located on private land, and therefore, long-term protection cannot be assured. Given the small size of populations on or within 120 m of the Project location and the abundance of suitable breeding habitat within the region, this habitat type is not considered to meet the criteria for significance
- Milksnake – Given that Milksnake are habitat generalists, the entire Project location was considered to be suitable habitat for Milksnake. As Milksnake are difficult to detect, use of the area was unconfirmed, and the size of the population is uncertain. The site is located on private land, and therefore long-term protection cannot be assured, though lands located on the Project location will be protected by Northland during the life of the Project. Milksnake are identified as a species of Special Concern on the *Endangered Species Act* (ESA), and therefore though use is unconfirmed, the area is treated as significant wildlife habitat.

3.1.3 *Animal Movement Corridors*

Potential animal movement corridors were identified in the hedgerows on and adjacent to the Project location, and the woodland south of the Project location.

Evaluation methodology of animal movement corridors is identified within Section 8.7 of the SWHTG. The criteria for significance are outlined in Table Q-4 of Appendix Q in the SWHTG, and include the following:

- Importance of areas to be linked by corridor – Areas linking critical habitats/significant areas.
- Importance of corridor to survival of target species – Corridors linking significant or critical habitat for a target species.
- Dimensions of corridor – Most significant corridors should be at least 200 m wide.
- Continuity of corridor – Corridor should be unbroken.
- Habitat and habitat structure of corridor – Corridor with several layers of vegetation and other structures, such watercourses.
- Species found in corridor or presumed to be using corridor – Corridors with high species diversity are significant.
- Risk of mortality for species using corridor – Corridors with low risk of roadkills or adjacent to residential areas.
- Opportunity for protection – Corridors within areas that may be protected, such as undeveloped shorelines or borders of conservation areas.
- provision of other related values (such as erosion protection).

The hedgerows and woodland are discussed separately below.

- Hedgerows – Section 8.7 of the SWHTG states that “fence and hedgerows should not be considered significant unless they provide the only animal movement corridors in the planning areas”. Given that there is a large animal movement corridor present in the local area (represented by the woodland south of the Project location), that the hedgerows are generally restricted to a depth of a single tree width and do not connect the woodland to other natural areas, these features are not considered to be significant wildlife habitat.
- Woodland south of the Project location – The woodland south of the Project location likely provides shelter for animal movement across the landscape. The woodland was identified as a potential animal movement corridor for large species of mammals (such as deer and coyotes), as well as terrestrial reptiles (such as Gartersnake), smaller mammals (such as raccoons and skunks), and birds (such as Blue Jays, Song Sparrows, and other passerines) species. Given the large size of the woodland, and that it connects several different habitat types (agricultural fields, wetlands, waterbodies, other wooded areas), this feature is considered to be significant.

3.1.4 *Overall Evaluation*

Significant wildlife habitat was identified on and within 120 m of the Project location in the following areas:

- All lands on and within 120 m of the Project location – Potential significant wildlife habitat for Milksnake.
- Woodland south of the Project location – Significant habitat for Ovenbird, significant old-growth forest, significant animal movement corridor.

3.2 Date of Beginning and Completion of Evaluation

The evaluation of wildlife habitat commenced with records reviews in May 2010 and was finalized with the completion of this report in December 2010. A site visit was completed in association with this evaluation on May 17, 2010.

3.3 Name and Qualifications of Evaluator

Evaluations of wildlife habitat were completed by Sean K. Male of Hatch.

Sean K. Male, M.Sc. is a Terrestrial Ecologist specializing in assessments of terrestrial habitat, flora and fauna. Sean received his Bachelors of Science (Honours) in Biology from Queen's University, where he completed his Honour's thesis under Dr. Raleigh J. Robertson, studying the impacts of nestbox density in Tree Swallows (*Tachycineta bicolor*) on nest-building behaviour. He then completed a Master's of Science degree in the Watershed Ecosystem Graduate Program at Trent University under Dr. Erica Nol. Sean's thesis focussed on examining the impacts of a Canadian diamond mine on a population of breeding passerines. For his thesis, Sean spent two summers in the Canadian arctic studying populations of Lapland Longspurs (*Calcarius lapponicus*) around the Ekati Diamond Mine, located 300 km northeast of Yellowknife. While at Trent, Sean participated in the Northern Saw-whet Owl (*Aegolius acadicus*) Migration Banding Project at the Oliver Centre. Following his time at Trent, Sean participated in the Landscape Monitoring Program, participating in a study of the impacts of woodlot size on breeding birds.

Sean joined Hatch as a Terrestrial Ecologist in 2006. Since joining Hatch, Sean has participated in several environmental assessments, REAs and other regulatory approvals for hydro, wind and solar power developments as the terrestrial biologist specializing in field investigations identifying flora and fauna species, including species of significance. He has developed and implemented baseline monitoring and impact assessment programs for both terrestrial wildlife and plant communities, including detailed bird and bat studies for several wind power developments, including the proposed 100-MW Coldwell Wind Power Development near Marathon, Ontario, a proposed 20-MW facility near Port Dover, Ontario, and a proposed 110-MW wind facility in southwestern Ontario. Sean has also conducted terrestrial and wetland vegetation surveys for several proposed hydropower projects totalling over 40 MW in southern and northern Ontario and has participated in fisheries surveys for several of these projects.

4. Woodlands

4.1 Description of Natural Feature

Section 1 of O. Reg. 359/09 defines "woodland" as land

- (a) that is south and east of the Canadian Shield

- (b) that has per hectare, at least
 - (i) 1000 trees of any size
 - (ii) 750 trees measuring over 5 cm in diameter
 - (iii) 500 trees measuring over 12 cm in diameter
 - (iv) 250 trees measuring over 20 cm in diameter
- (c) that does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.

There are several woodlands on and within 120 m of the Project location (Figure 1.1).

4.2 Evaluation Criteria and Guidelines for Woodlands

The EOS was completed in consideration of the evaluation approach outlined in Section 7 of the NHRM (MNR, 2010a). The evaluation criteria recommended in the NHRM to assess significance of a woodland are as follows:

- Woodland Size – Woodlots greater than 50 ha in size in this region are considered significant. This size recommendation is for this area where woodlots represent approximately 30% to 60% of the land cover.
- Ecological Functions
 - ◆ Woodland Interior – Woodlands with 8 ha or more of interior habitat.
 - ◆ Proximity to Other Woodlands or Other Habitats – Woodlands within 30 m of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland.
 - ◆ Linkages – Woodlands providing a connecting link between two other significant features within 120 m of the woodland.
 - ◆ Water Protection – Woodlands located within a sensitive or threatened watershed or within 50 m of various water features (such as watercourses or sensitive recharge areas).
 - ◆ Woodland Diversity – Woodlands with (i) a naturally-occurring composition of forest species that have declined, or (ii) with a high native diversity through a combination of composition and terrain.
- Uncommon Characteristics – Woodlands with (i) a unique species composition or site; (ii) a vegetation community with a provincial ranking of S1, S2, or S3; (iii) important habitat or a rare, uncommon, or restricted woodland plant species; or (iv) characteristics of older woodlands or woodlands with larger tree-size structure in native species.
- Economic and Social Functional Values – Woodlands with (i) a high productivity in terms of economic value products together with continuous native natural attributes; (ii) a high value in special services, such as air quality improvement or recreation at a sustainable level that is compatible with long-term retention; or (iii) important identified appreciation, education, cultural or historical value.

4.3 Date of Beginning and Completion of Evaluation

The evaluation of woodlands commenced with records reviews in May 2010 and was finalized with the completion of this report in December 2010. Site visits were completed in association with this evaluation on May 17, 2010.

4.4 Determination of Significance

The woodland adjacent to the southern boundary of the Project is estimated to be 61.8 ha, with 15.1 ha of interior forest habitat. The MNR has identified this woodland as significant for size, old growth, forest interior, linkages, and water protection criteria (MNR, 2010b). As a result, the woodland is identified as a significant woodland.

4.5 Name and Qualifications of Evaluator

Evaluations of woodland significance were completed by Sean K. Male of Hatch. His qualifications are provided within Section 3.4.

5. Conclusions

Results of the EOS are summarized in Table 5.1. Based on the EOS outlined above, there is a significant wildlife habitat present on and within 120 m of Project components.

An environmental impact study conducted according to the requirements of Section 38 (2) of O. Reg. 359/09 will be required in order to construct Project components within 120 m of these features.

Table 5.1 Significant Natural Features on and within 120 m of the Project Location

Natural Feature		Project Location	Adjacent Lands (within 120 m)	Notes
SIGNIFICANT	Valleyland	No	No	
	Woodland	No	Yes	The woodland south of the Project location is considered to be significant.
	Wildlife Habitat	Yes	Yes	Several significant wildlife habitats were identified on and within 120 m of the Project location.
PROVINCIALY SIGNIFICANT	Wetland	No	No	
	Earth Science ANSI	No	No	
	Life Science ANSI	No	No	

6. References

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