



Stantec

**OSTRANDER POINT WIND ENERGY PARK
NATURAL HERITAGE ASSESSMENT AND
ENVIRONMENTAL IMPACT STUDY**

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Executive Summary

Gilead Power Corporation (“Gilead”) is an Ontario-based private, renewable energy development company dedicated to providing renewable energy for Ontario. In response to the Government of Ontario's initiative to promote the development of renewable, pollution-free electricity in the province, Gilead is proposing to develop the Ostrander Point Wind Energy Park (the Project) in Prince Edward County, Ontario.

The Project Location for this report includes all parts of the land in, on or over which the Ostrander Point Wind Energy Park project is proposed. The basic components of the Project include nine (9) GE xl 2.5 MW wind turbine generators with a total installed nameplate capacity of 22.5 MW, transformers included within each turbine, one on-site substation including transformer and electrical collector lines. This system will transport the electricity generated at the wind farm to Hydro One Networks Inc.'s (Hydro One's) Distribution Network. The Project also includes roads which provide access to the turbines for ongoing maintenance as well as electrical equipment and systems required for interconnection to the Hydro One grid. The turbines will be situated exclusively on Crown land, known as the Ostrander Point Crown Land Block (Subject Property).

Gilead retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) Application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). This Natural Heritage Assessment is intended to satisfy the requirements outlined within O. Reg. 359/09 (Sections 24 through 28 and 38) and is to be submitted as a component of the REA under the *Green Energy and Green Economy Act* (GEA). It is also intended to satisfy requirements as outlined in MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (APRD) (September 2009).

This report identifies the existence and boundaries of natural features in and within 120 m of the Project Location based on a review of background records and on-site field investigations. As the Project Location is within 120 m of natural features, this report provides an evaluation of significance for each identified feature based on either an existing MNR designation of the feature, or by using evaluation criteria or procedures established or accepted by the MNR. An Environmental Impact Study (EIS) is provided with respect to significant natural features that are found within 120 m of the Project Location. The EIS identifies and assesses any potential negative environmental effects related to the Project and identifies mitigation measures (O.Reg. 359/09, s.38).

Natural features identified on the Subject Property through the records review process included wetlands, woodlands, areas of natural and scientific interest (life science), and wildlife habitat. No provincial parks or conservation reserves were identified within the Subject Property.

A site investigation occurred over all four seasons between August 2006 and June 2010, and involved detailed reviews of the vegetation communities and associated wetlands, wildlife monitoring surveys (i.e., mammals, amphibians, reptiles and birds), and a review of surface water. The investigation was conducted with the purpose of confirming the status and boundaries of natural features identified through the records review and identifying any additional features. The site investigation confirmed the presence of wetland, woodland and wildlife habitat features within the Subject Property.

Natural heritage information collected from the records review, the site investigation and consultations were analyzed to determine the significance and sensitivity of existing ecological features and functions. For all natural features existing in, or within 120 m of, the Project Location, a determination was made of whether the natural feature is provincially significant, significant, not provincially significant or not significant.

The following significant features are located within 120 m of the Project Location, requiring an Environmental Impact Study: provincially significant wetland and coastal wetland, significant woodland and significant wildlife habitat (seasonal concentration area for migrating landbirds; rare alvar vegetation communities, specialized habitat for woodland amphibian breeding and declining shrub/succession breeding bird species of conservation concern).

Potential impacts of the Project on each significant or provincially significant natural feature were assessed and mitigation measures identified. **Table 5.1, Appendix B** summarizes the general impacts and suggested protective mitigation and compensation measures to minimize and mitigate the potential negative impacts associated with the planning, design and construction of the proposed Project.

Once the identified protective, mitigation and compensation measures are applied to the environmental features discussed above, the construction and operation of the Project is not predicted to result in significant residual environmental impacts on the significant features and functions identified through the Natural Heritage Assessment process. An environmental effects monitoring plan that includes a post-construction monitoring program will be developed to confirm the accuracy of predicted effects as well as to monitor the effects to other natural elements.

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1.0 Introduction

1.1 BACKGROUND

Gilead Power Corporation (“Gilead”) is an Ontario-based private, renewable energy development company dedicated to providing renewable energy for Ontario. In response to the Government of Ontario’s initiative to promote the development of renewable, pollution-free electricity in the province, Gilead is proposing to develop the Ostrander Point Wind Energy Park (the Project) in Prince Edward County, Ontario.

The basic components of the Project include nine (9) GE xl 2.5 MW wind turbine generators with a total installed nameplate capacity of 22.5 MW, transformers included within each turbine, one on-site substation including transformer and electrical collector lines. This system will transport the electricity generated at the wind farm to Hydro One Networks Inc.’s (Hydro One’s) Distribution Network. The Project also includes an existing 60 m high meteorological testing tower (MET tower), roads to access the turbines for on-going maintenance as well as electrical equipment and systems required for interconnection to the Hydro One grid. The underground collector line system follows the access roads and is incorporated into the access road footprint. The turbines will be situated exclusively on Crown land, known as the Ostrander Point Crown Land Block.

The “Project Location” includes any airspace and all parts of the land in, on or over which the Ostrander Point Wind Energy Park project is proposed. For the purposes of the identification of natural heritage features and the assessment of potential effects, a “Zone of Investigation” has been identified based on the requirements of Ontario Regulation 359/09 (O. Reg. 359/09). The Zone of Investigation is measured as 120 m from the outer limit of the Project Location.

For the purposes of the Natural Heritage Assessment, a “Subject Property” has been determined which encompasses the Project Location and all of the Ostrander Point Crown Land Block. The Project Location, Zone of Investigation and Subject Property are shown on **Figure 1, Appendix A**.

Gilead retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) Application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). This report has been prepared in accordance with O. Reg. 359/09 (Sections 24 through 28 and Section 38).

A draft Natural Heritage Assessment was submitted to MNR on December 22, 2009. Comments were received from MNR on March 8, 2010 and are included as **Appendix C**. As a result of these comments additional work was conducted and the Draft Natural Heritage Assessment was revised to incorporate the results of this additional work and include consideration of MNR’s comments.

1.2 APPLICABLE LEGISLATION

This Natural Heritage Assessment is intended to satisfy the requirements outlined within Ontario Regulation 359/09 (Sections 24 through 28 and 38) and is to be submitted as a component of the REA under the *Green Energy and Green Economy Act* (GEA). The Subject Property is not located within the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan Area or the Protected Countryside of the Greenbelt Plan.

A Natural Heritage Assessment is required to determine whether any of the following features exist in and/or within 120 metres of the Project Location:

- Wetlands;
- Coastal wetlands;
- Life Science Areas of Natural and Scientific Interest (ANSIs);
- Earth Science ANSIs;
- Valleylands;
- Woodlands;
- Wildlife habitat; and,
- Provincial parks and conservation reserves.

This report identifies the existence and boundaries of all natural features within 120 m of the Project Location based on a review of background records and on-site field investigations. As the Project Location is within 120 m of natural features, this report provides an evaluation of significance for each identified feature based on either an existing MNR designation of the feature, or by using evaluation criteria or procedures established or accepted by the MNR.

If the Zone of Investigation extends into any of the identified significant features (50 m of a provincially significant Earth Science ANSI, 120 m for all other specified natural features) an Environmental Impact Study (EIS) is required that identifies and assesses any negative environmental effects and identifies mitigation measures (O.Reg. 359/09, s.38).

Guidance provided by the Ministry of Natural Resources in MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (APRD) (September 2009) was taken into account in preparing this document. Any MNR approvals or permits required will be addressed separately through the applicable statute and its permitting process.

2.0 Records Review

2.1 METHODS

The records review was prepared in accordance with O. Reg. 359/09, s. 25 (3).

Background data were collected and reviewed to identify natural features located in, or within 120 meters of the Project Location. Documents reviewed and agencies contacted included but were not limited to:

- Ministry of Natural Resources. Communications with Erin Cotnam, Melissa Laplante, Todd Norris and Bryan Sears.
- Ministry of Natural Resources. Correspondence dated February 25, 2008, March 10 and May 27, 2009.
- Ministry of Natural Resources, Peterborough District. Natural Heritage Development Review Form “Ostrander Point Wind Farm”. November 14, 2007.
- Natural Heritage Information Centre (NHIC) database. February 2007. Natural Areas and Species records search. <http://www.mnr.gov.on.ca/MNR/nhic/nhic.html>. OMNR, Peterborough. Accessed June 2008.
- Ontario Ministry of Natural Resources. 2007. Land Information Ontario (LIO) digital mapping.
- Environment Canada/Canadian Wildlife Service. Correspondence dated March 4 and March 17, 2008, February 24, 2010 (Denise Fell and Lyle Friesen).
- Environment Canada (2007). Endangered, Threatened and Special Concern Species.
- Important Bird Areas database (IBA Canada, undated)
- Prince Edward County South Shore Important Bird Area Conservation Plan (Wilson and Cheskey, 2001)
- Natural Heritage Area – Life Science Checksheet (Snetsinger, 2000)
- Assessment of and Management Prescription for the Ostrander Point Crown Land Block in Prince Edward County (Bland, 1997)
- Prince Edward County Official Plan (2008)
- Various wildlife atlases (birds, mammals, herpetofauna, butterflies).
- Renewable Energy Atlas (2010) Bat hibernacula mapping
- Quinte Conservation Authority
- Prince Edward Point Bird Observatory banding data
- *Bats and Bat Habitats. Guidelines for Wind Power Projects*. Draft. Ontario Ministry of Natural Resources. March, 2010.

Information received from each source and the manner in which it was considered is indicated within the identification of natural features (**Section 2.2**).

2.2 RESULTS

A review of available background information has indicated the presence of known natural features occurring within the Subject Property including the Zone of Investigation. The results of the records review search were used to determine whether the Project Location is in a natural feature, within 50 m of an earth science area of natural and scientific interest, or within 120 m of other natural features.

2.2.1 Wetlands

No wetland features were identified within the Project Location. One provincially significant wetland (PSW) complex and patches of unevaluated wetlands were identified within 120 m of the Project Location.

A section of the provincially significant South Bay Coastal Wetland is found within 120 m of the Project Location (NHIC, MNR Correspondence 2008). Mapping indicates that the majority of this wetland complex occurs outside of the Subject Property, but small portions extend south, to within 120m of the Project Location. The South Bay Coastal Wetland PSW is 231 ha in size and comprised of 66% swamp and 34% marsh (MNR, 2008).

Unevaluated wetlands were identified within the southeastern corner of the Subject Property, within 120 m of the Project Location (Land Information Ontario (LIO) mapping, 2007).

2.2.2 Areas of Natural and Scientific Interest (ANSIs)

The entire Subject Property is situated within a Candidate Life Science ANSI, the Prince Edward to Ostrander Point ANSI. This Candidate ANSI is shown on Figure 1 (**Appendix A**) and extends from Prince Edward Point to approximately Petticoat Point, encompassing 2000 ha. As noted by the MNR (2008) “the combination of size, extent of shoreline, known species diversity and special features make this site unique in the Site District”.

There were no earth science ANSIs identified in the Subject Property through the records review.

2.2.3 Valleylands

There were no valleylands identified in the Subject Property through the records review.

2.2.4 Woodlands

The Prince Edward County Official Plan (2008) does not identify significant woodland or procedures for determining significant woodland for the County. MNR’s LIO mapping (2007)

indicates the presence of woodland throughout much of the southern half of the Subject Property, however, site-specific work by Bland (1997) and Snetsinger (2000) indicated that some of this area is more accurately characterized by shrubland. Bland (1997) and Snetsinger (2000) outlined eight main vegetation communities found in the Ostrander Point Crown Land Block:

- Open grassland;
- Grassland-short shrub;
- Short shrubland;
- Tall shrubland;
- Open woodland;
- Seasonal deciduous swamp woodland;
- Graminoid marsh;
- Beach shoreline;
- Meadow marsh; and,
- Thicket swamp.

Local site conditions such as microclimate, slope, aspect, soil texture, moisture and drainage, as well as the proximity of the site to Lake Ontario determine the plant communities on the property. The most distinctive vegetative characteristics of the Subject Property, based on Bland (1997), included:

- Grassland –several species of grasses with scattered low shrubs;
- Graminoid marsh – located in southeast section of the Subject Property, this is the only unit of this type in the Subject Property. Similar undisturbed marshes are becoming increasingly rare along the Great Lakes;
- Alvar vegetation – found scattered within grassland/shrub communities mostly in the northern half of the Subject Property. Plant species found in these areas include narrow-leaved vervain, bluets, spike-rush, and false pennyroyal.

2.2.5 Wildlife Habitat

A preliminary assessment was undertaken to identify the potential for features that may be designated as Significant Wildlife Habitat (i.e. seasonal concentration areas, rare vegetation communities or specialized habitats, movement corridors and habitats of species of conservation concern) in or within 120 m of the Project Location.

The Prince Edward County South Shore Important Bird Area (IBA) encompasses the southeastern peninsula of Prince Edward County, including the Subject Property (**Figure 1, Appendix A**) (IBA Canada, undated; Wilson and Cheskey, 2001). The Prince Edward County South Shore IBA is also referred to as the Prince Edward Point IBA (IBA Canada, undated) and is reported variously to encompass approximately 91 km² (26 km² of land and 65 km² of nearshore waters; Wilson and Cheskey, 2001) or 371 km² (IBA Canada, undated). For the purposes of this report, it will be referred to as the Prince Edward County South Shore IBA. The Prince Edward Point Bird Observatory and National Wildlife Area are located within the IBA at the tip of the Prince Edward Point peninsula, and the Point Petre Provincial Wildlife Area is located at the western end of the IBA.

BirdLife International, in cooperation with Bird Studies Canada and Nature Canada, identifies IBAs. IBAs are areas that support specific groups of birds: threatened birds, large groups of birds, and birds restricted by range or by habitat. Sites were identified by Bird Studies Canada using a set of criteria developed and applied by a Technical Steering Committee. Important Bird Areas (IBA) have not been afforded legal protection by either the provincial or federal governments. IBAs are not considered a “natural feature” under the Renewable Energy Act (O. Reg. 359/09) however the functions which support the identification of IBA’s are considered under the relevant significant wildlife habitat components below.

2.2.5.1 Seasonal Concentration Areas

No deer yards have been identified in the Subject Property (LIO 2007; PEC Official Plan, 2008). No known bat hibernacula have been identified within the Subject Property (Renewable Energy Atlas, 2010). No bat hibernacula features were identified through the record review (i.e. karst topography, abandoned mines, forested ridges). There are no known maternity roosts.

The IBA has been designated as globally significant under the congregatory species category for wintering waterfowl, migratory raptors, and migratory landbirds (Wilson and Cheskey, 2001). The off-shore portions of the IBA support globally significant concentrations of waterfowl and nationally significant concentrations of waterbirds and seabirds. The IBA summary notes that the most important waterfowl staging and wintering areas for Greater Scaup, Long-tailed Ducks and White-winged Scoter are the shoals and deep waters off the tip of the Prince Edward Point peninsula. Appendix K of the Significant Wildlife Habitat Technical Guide (SWHTG), (MNR, 2000) also cites the Prince Edward County shores as a significant site for waterfowl.

The IBA is a globally significant concentration area for landbirds during both the spring and fall migration periods. Species such as Tree Swallow, Blue Jay, Black-capped Chickadee, Golden-crowned Kinglet, Ruby-crowned Kinglet, Yellow-rumped Warbler, Dark-eyed Junco and White-throated Sparrow can be observed in large numbers within the IBA during migration.

Open water shorelines along the Great Lakes, particularly Lake Erie and Lake Ontario are known to provide staging areas for migrating songbirds. Geography may in part, dictate use of shoreline areas as many birds opt to cross at narrow spots (i.e. Rondeau, Long Point, Pelee). Recent radar studies in the Great Lakes Basin characterized landscapes used by migratory birds for stopovers. The research showed that migrants select forested areas in close proximity to water (Bonter et al., 2008). Similarly, Ewart et al. (2006) ranked relative importance of attributes associated with stopover sites associated with migrating landbirds in the Western Lake Erie Basin. The results of this analysis indicated that landbirds may be particularly concentrated in riparian woodland located within 0.4 km of the lakeshore.

During the fall migration, large numbers of raptors move up the point including Sharp-shinned Hawks, Red-shouldered Hawks and Red-tailed Hawks. Prince Edward Point has also been recognized as a major concentration area for fall migrating Northern Saw-whet Owls (Wilson and Cheskey, 2001).

Monarch butterflies (a provincial species of special concern) are reported to congregate in the Subject Property in the fall (MNR, 2007a). During fall migration, general patterns in movement occur, in particular the routes used to cross the Great Lakes. The majority of fall migrating monarchs in Ontario use three such staging areas: Point Pelee, Long Point, and Presqu'île Point (C. Taylor, pers. comm., 2006).

Dr. Taylor indicated that most of the eastern Ontario populations of monarchs are believed to cross Lake Ontario at the Presqu'île Point staging site. Large numbers of monarchs can be observed throughout southern Ontario along shoreline areas during migration, however these areas do not host the significant thousands that regularly occur at the three main staging areas.

2.2.5.2 Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (SWHTG, 2000). No animal movement corridors were identified in the Subject Property (LIO, 2007).

2.2.5.3 Rare Vegetation Communities or Specialized Habitats

Alvar habitat communities can be considered significant wildlife habitat. The southern third of Prince Edward County contains limestone bedrock which is covered by a shallow layer of soil. The southern location, soil textures, drainage patterns, microclimate and proximity to Lake Ontario have resulted in the development of alvar-like conditions throughout much of this area (Wilson and Cheskey, 2001).

The Prince Edward County Official Plan identifies Great Blue Heron rookeries and osprey nesting sites and considers them Environmentally Sensitive Areas (PEC Official Plan, 2008). No such areas were identified in the Subject Property, however the area where Ostrander Point Road terminates at Lake Ontario is marked as an “other sensitive site” (PEC Official Plan, 2008; Schedule A).

Wildlife records from the Subject Property assessed in relation to vegetation communities and known natural features found within the Subject Property indicate that two specialized habitats have the potential to occur to some degree in the Project Location: habitat for area-sensitive species and amphibian woodland breeding ponds.

2.2.5.4 Species of Conservation Concern

Primary and secondary source data were used to determine potential wildlife use of the Subject Property. NHIC was used to identify historic records of species of conservation concern that occur from the Subject Property. Inventories of wildlife were compiled from available literature and resources including the Atlas of the Mammals of Ontario (Dobbyn, 1994), the Ontario Herpetofaunal Summary (Oldham and Weller, 2000), Ontario Odonata Atlas (NHIC, 2005) and the Ontario Breeding Bird Atlas (Cadman et al., 2007). It is important to note that the exact location of species occurrences are not available from these atlases and, instead, are recorded within 10 x 10 km or 100 x 100 km squares. Therefore, although they can be useful resources, the identified species recorded from these databases may not occur within the Subject Property. Based on various atlases, 31 species of mammals, 12 species of amphibians and 12 species of reptiles have ranges that overlap the Subject Property.

Species at risk, that would be considered of conservation concern, and whose presence would be assessed within an evaluation of significant wildlife habitat in the Subject Property are listed in **Table 2.1, Appendix B**. Endangered and threatened species are addressed as part of the APRD requirements and are discussed in **Section 2.3.2**.

2.2.6 Provincial Parks and Conservation Reserves

There were no provincial parks or conservation reserves identified in the Subject Property through the records review.

2.3 MNR APPROVAL AND PERMITTING REQUIREMENTS DOCUMENT (APRD) INFORMATION

2.3.1 Fish and Fish Habitat

As the Project is located on Crown land, site information is maintained by MNR. As such, MNR data was utilized for the mapping of watercourses present in the Subject Property. Only one unnamed permanent and various unnamed intermittent watercourse were identified via MNR

mapping as being within the Subject Property and no additional information was available regarding the specific features of each watercourse.

Quinte Conservation Authority (QC) was also contacted (January and July 2008) to obtain data on fisheries and watercourses in the Subject Property. Quinte Conservation stated that the MNR should be contacted for this information.

2.3.2 Endangered Species

According to the NHIC database and Environment Canada's SAR online mapping, a total of 6 wildlife species protected under the *Endangered Species Act, 2007* have been identified in the general vicinity of the Subject Property. Provincially threatened and endangered species identified during the records review are listed in **Table 2.2, Appendix B**.

2.3.3 Petroleum Resources

No petroleum resources were identified within Project Location or Zone of Investigation through the records review (Ontario Oil, Gas and Salt Resources Library. 2010. Oil and Gas Pools, Wells and Pipelines of Southern Ontario GIS dataset).

2.3.4 Hazard Lands

There are no hazard lands identified within the Subject Property.

2.3.5 Crown Forest Reserves

There are no Crown Forest Reserves within the Subject Property.

2.3.6 Mineral Aggregate Resources

There are no mineral aggregate deposits identified within the Subject Property (Prince Edward County Official Plan, 2008).

3.0 Site Investigation

The site investigations were conducted in accordance with O. Reg. 359/09, s. 26 (1). This section of the report is prepared in accordance with s. 26 (3).

The site investigations in support of this report were completed with the purpose of confirming the status and boundaries of natural features identified through the records review and identifying any additional features. Data collected during the records review concerning natural features and species occurrences were used to guide the scope and direction of site investigations. The studies occurred over all four seasons between August 2006 and June 2010, and involved detailed reviews of the vegetation communities and associated wetlands, wildlife monitoring surveys (i.e., mammals, amphibians, reptiles and birds), and a review of surface water. The field surveys were undertaken within the Subject Property to detail current conditions within the Project Location and the 120 m Zone of Investigation. Dates, times, duration, field personnel and weather are presented in **Table 3.1 and 3.2 (Appendix B)**. The following provides details of the survey methods.

A map showing the boundaries of any natural feature located within 120 m of the Project Location, the location and type of each natural feature and the distance from the Project Location to the natural feature boundaries is provided in **Figure 2 (Appendix A)**.

3.1 METHODS

3.1.1 Vegetation Community and Vascular Plants Assessment

Botanical inventories were carried out on June 10 and 11, 2008 and on June 8, 10 and 24, 2010. Survey dates, times, weather conditions and field personnel are summarized in **Table 3.1, Appendix B**. Field investigations included Ecological Land Classification (ELC) of vegetation communities and a floristic survey. Vegetation communities were delineated on aerial photographs and checked in the field; community characterizations (i.e., ecosites and ecotypes) were then based on the ELC system (Lee et al., 1998). Colloquial and scientific nomenclature of plant species generally follows Newmaster et al. (1998).

Treed areas identified during vegetation surveys were compared to the definition of woodlands provided in O. Reg. 359/09 to delineate the limits of “woodlands”. Treed areas were also compared to the definition of woodland provided in the Natural Heritage Reference Manual (2010). Information regarding woodland size, ecological function and uncommon characteristics was collected during ELC surveys and through GIS analysis.

3.1.2 Wetland Verification and Delineation

Portions of the South Bay Coastal Wetland mapped as occurring within the Subject Property were delineated in the spring of 2009 using methods outlined by Ontario Wetland Evaluation System (OWES) Southern Manual protocol (OMNR, 2002). The wetland boundaries were flagged and surveyed using a Thales MobileMapper CE sub-metre GPS. Preliminary wetland delineation and mapping was completed on March 23, 2009 and confirmed on May 28, 2009.

Survey dates, times, weather conditions and field personnel are summarized in **Table 3.1, Appendix B**.

3.1.3 Amphibian Surveys

Given the size of the Subject Property, a good proportion of which provides potential amphibian habitat, sixteen stations were identified for calling amphibian surveys (**Figure 4, Appendix A**).

Amphibian call count surveys were conducted on April 22, May 6, and June 10, 2008. Temperatures were 8°C, 8°C and 22°C respectively. Survey dates, times, weather conditions and field personnel are summarized in **Table 3.1, Appendix B**. Calling amphibian surveys followed the protocols identified in the Marsh Monitoring Program Manual (Bird Studies Canada, 1994) and the Amphibian Road Call-Counts Participants Manual (Environment Canada, 1997). Surveys were conducted between one-half hour after sunset and midnight.

The protocol involved the surveyor standing at each selected station and listening for three minutes. Amphibians were recorded to be within each surveyed station if they were within 100 metres of the surveyor. Consistent with the Marsh Monitoring Program protocol, all calling activity was ranked using one of the following three abundance code categories: (1) calls not simultaneous – number of individuals can be accurately counted; (2) some calls simultaneous – number of individuals can be reliably estimated; and (3) full chorus – calls continuous and overlapping, so number of individuals cannot be reliably estimated.

3.1.4 Reptile Surveys

A total of six reptile surveys were conducted from May to August, 2009 with two surveys in May, two in June and single surveys in each of July and August. Surveys were conducted in the afternoon to dusk. Survey dates, times, weather conditions and field personnel are summarized in **Table 3.1, Appendix B**.

The purpose of the studies was to assess habitat potential and use of the site by Blanding's Turtles during different parts of their life histories: hibernation, courtship/mating, spring foraging, nesting, aestivation, and hatchling stage. The surveys were specifically targeted at Blanding's Turtle but all observations of reptiles, amphibians and other wildlife were recorded.

The survey consisted of one or two surveyors walking wandering transects through the Subject Property. The two surveyors spread out to allow full coverage of the Subject Property. Although a specific habitat type was targeted during each survey, effort was made on all visits to cover the entire Subject Property to increase the potential to observe reptiles or potential hibernacula features. Snakes typically overwinter in underground dens below the frost line, often in congregations. From the surface, potential hibernacula are identified as features that would provide a route underground, including buried concrete or rock (e.g. building foundations, culverts), rock crevices or animal burrows.

When reptiles or potential hibernacula features were observed, their location was recorded using a GPS. For all observations of individuals notes were taken on behavior and the habitat in use. No turtles were handled during the surveys and observers maintained a distance of approximately 15 m to minimize disturbance to the animals. Signs such as footprints in mud or egg fragments were also recorded by GPS with notes on habitat present. A detailed description of the study methodology and results are provided in the **Ostrander Point Wind Energy Park Blanding's Turtle Habitat Assessment (Appendix D)**.

3.1.5 Bird Surveys

A comprehensive bird survey program has been conducted in the Subject Property by Jacques Whitford Limited, Acadia University and Stantec. The survey program was developed based on guidance provided in Environment Canada's "Wind Turbines and Birds: A Guidance Document for Environmental Assessment" (Environment Canada, 2007a). The proposed work program was circulated to Environment Canada and the Ministry of Natural Resources on May 8, 2008 and approved by Environment Canada on June 5, 2008. The bird work program included:

- Winter raptor surveys (Jacques Whitford, February and March, 2008 and Stantec, January – March, 2009);
- Spring waterfowl foraging and movement surveys (Stantec, April and May, 2008);
- Spring passerine migration monitoring - Radar and area searches (Acadia, May and June, 2008);
- Breeding American Woodcock and Wilson's Snipe surveys (Stantec, April and May, 2008);
- Breeding bird surveys (Stantec, June, 2008);
- Fall passerine migration monitoring – Radar and area searches (Acadia, August - October, 2008); and
- Fall raptor migration surveys (Jacques Whitford, August - November, 2006 and Stantec, August- October 2009).

- Whip-poor-will Surveys (Stantec, May-June, 2010).

Survey dates, times, and weather conditions are summarized in **Table 3.2, Appendix B**. Methods of all surveys were generally consistent with the recommendations of Environment Canada (2007a, 2007b). Detailed descriptions of each survey methodology are provided in the **Ostrander Point Wind Energy Park Whip-poor-will Report (Appendix D)** and **Ostrander Point Wind Energy Project Bird Report (Appendix E)**.

3.1.6 Bat Surveys

A bat monitoring program was developed for the Subject Property following guidance provided within MNR's document "Guideline to Assist in the Review of Wind Power Proposals: Potential Impacts to Bats and Bat Habitats" (Working Draft, August 2007).

The program included radar monitoring in May, August, September and October, 2008; and acoustic monitoring at four stations within the Subject Property in July, August and September, 2008 and 2009.

Detailed descriptions of the survey methodologies and results are provided in the **Ostrander Point Wind Energy Project Acoustic Bat Monitoring Report (Appendix F)**.

3.1.7 Wildlife and Wildlife Habitat

Although specific site visits are assigned to target particular groups (i.e. amphibians, birds), all visits were conducted by qualified ecologists and are used as a means of recording all wildlife observed on site. As such, all observations made over the duration of the field program are compiled within the list of wildlife for the Subject Property and are considered in the assessment of wildlife use of the site. Collectively, these multiple surveys, the habitats they cover and the period over which they occur (season and time of day) offer a comprehensive set of field observations for various flora and fauna species on site.

3.2 APRD INFORMATION

3.2.1 Fish and Fish Habitat

Potential stream crossings associated with the development of the Project were originally assessed by Jacques Whitford for the Subject Property.

A fish habitat assessment was conducted by Stantec to determine the quality of fish habitat within two watercourses within the Subject Property (October 16 and 22, 2008). This included the assessment and mapping of watercourses, fish habitat, existing fish communities and water quality conditions within the Subject Property.

The assessment of fish habitat followed the criteria established by the MNR (1994), which has been developed based on levels of protection required for proposed developments in and around lakes and streams. This assessment was also used to characterize the watercourse according to Fisheries and Oceans Canada (DFO) fish habitat types.

Fish habitat was further assessed during a site visit with Gilead, MNR and Quinte Conservation on November 23, 2009.

Additional information regarding watercourses is provided within the **Water Report** as part of the REA application.

3.2.2 Endangered Species

In addition to field programs undertaken as part of the site investigations detailed in **Section 3.1**, targeted surveys were conducted for Henslow's Sparrow, Blanding's Turtle and Whip-poor-will. Detailed methods are provided in **Appendix E** (Henslow's Sparrow) and **Appendix D** (Blanding's Turtle and Whip-poor-will).

3.3 RESULTS

A summary of the corrections to the natural features, or potentially occurring natural features, identified through the records review as a result of the Site Investigation program is contained in **Table 3.3, Appendix B**. Any new features or functions identified as a result of the Site Investigation are discussed in the text below. **Figure 2, Appendix A** shows the boundaries located within 120 m of the Project Location of natural features, the location and type of each feature and the distance from the Project Location to the natural feature boundaries. Field notes for each survey conducted as part of the site investigation are provided in **Appendix G**.

3.3.1 Wetlands

Site visits to verify the presence of wetland on the Subject Property indicated that a portion of wetland mapped in the northwestern portion of the Ostrander Point Crown land block does not exist. This was confirmed by MNR (B. Sears, pers. comm., September 14, 2009) and mapping in MNR's database has since been revised. The majority of the South Bay Coastal Wetland is situated outside of the Subject Property, associated with a watercourse north of Helmer Road, flowing westward towards South Bay. Small portions extend into the northern portion of the Subject Property.

Wet depressions containing thickets were scattered throughout the Subject Property. Within the southeastern portion of the Subject Property was a pair of unevaluated wetlands that were hydrologically connected to each other. A deciduous swamp that straddled the eastern boundary held standing water in the spring and fall. Through a small watercourse, the water flowed to a coastal marsh located to the south. A barrier beach separated this coastal marsh from Lake Ontario, but it is expected that there are occasional breaches of the beach to connect this marsh to the waters of Lake Ontario. The location of the unevaluated wetlands mapped in

the Subject Property was verified through field investigations. A narrow strip of willow deciduous swamp extends along the shoreline, connecting to an additional area of ash deciduous swamp. These communities were determined to comprise part of the wetland feature. The vegetation communities are described in **Table 3.4, Appendix B** and shown on **Figure 3, Appendix B**.

A complete list of vascular plant species recorded in the Subject Property is provided in **Appendix H**. The aquatic habitats of the Subject Property were generally seasonal and restricted in size. Where surface water is maintained long enough into the summer before the area dries, certain aquatic plants have been able to colonize and persist. Typically, these aquatic species were graminoids (e.g., *Eleocharis* spp., *Juncus* spp., *Carex* spp.), often located along the edges of roadways that are seasonally flooded. The small ponds located in the northern portions of the Subject Property hosted some of these species of graminoids, and other herbaceous species, such as water horehound and purple loosestrife, but did not have high species or structural diversity due to their small size and the temporal drying that occurred during midsummer. Greater diversity occurred in the larger wetlands in the eastern portion of the Subject Property, including the coastal marsh and the deciduous swamp. The coastal marsh located in the southeastern portion of the Subject Property supported cattails, dogwood, and several submerged aquatic species (e.g., mermaid-weed, floating pondweed). The deciduous swamp located at the eastern boundary of the Subject Property supported a number of wetland species, but it was only in those areas toward the eastern boundary and beyond where aquatic species were found. These species included blue flag, fringed loosestrife, purple loosestrife and water horsetail.

3.3.2 Areas of Natural and Scientific Interest (ANSIs)

ANSIs are defined as areas with life or earth science values related to protection, scientific study or education. The site investigations confirmed the presence of life science values, as discussed in further subsections, and did not identify the presence of earth science values. No corrections were required to the results of the record review as a result of the site investigations (**Table 3.3, Appendix B**).

3.3.3 Valleylands

Valleylands are defined as a natural area that is south and east of the Canadian Shield and occurs in a valley or other landform depression that has water flowing through or standing for some period of the year (NHRM, 2010). Section 8.3 of the NHRM 2010) was used guide the identification of valleylands within the Subject Property. Site investigations confirmed that the topography of the site is flat, and landform depressions are absent. ELC and vegetation assessments did not indicate the presence of a linear vegetated system within the Subject Property (**Figure 3.0, Appendix A**). The site investigations confirmed the absence of valleylands in the Subject Property. No corrections were required to the results of the record review as a result of the site investigations (**Table 3.3, Appendix B**).

3.3.4 Woodlands

Much of the area identified during the records review as woodland within the Subject Property was determined to be red cedar- grey dogwood shrub alvar. This type of alvar covers most of the northern half of the Subject Property. Tree species found within this community included red ash, bur oak and shagbark hickory, however these occurrences were occasional throughout the community and tree cover per hectare was less than 5% and did not meet the criteria of a woodland (i.e. 1,000 trees of any size, 750 trees over 5 cm in diameter, 500 trees over 12 cm, 250 trees over 20 cm, *O. Reg. 359/09*).

Communities, meeting the criteria of a woodland (i.e. 1,000 trees of any size, 750 trees over 5 cm in diameter, 500 trees over 12 cm, 250 trees over 20 cm, *O. Reg. 359/09*) were found within the Subject Property in the form of deciduous swamp, thicket swamp and woodland alvar (**Figure 3, Appendix A** and **Table 3.4, Appendix B**). Ash swamps and willow swamps occurred along the northeastern boundary of the Subject Property, along the lakeshore and in small pockets throughout the site. Small pockets of cultural savannah were located in the northwestern portion of the Subject Property.

The largest contiguous woodland community that occurs within the Subject Property is comprised of a complex that includes treed alvar, deciduous swamp and deciduous swamp. Representative photographs of the vegetation communities are shown in **Appendix I**. As recommended in the ELC for Southern Ontario (Lee et al., 1999), the treed communities were complexed as they formed a pattern of two or more vegetation types in a mosaic that could not be mapped at the site level of resolution. Due to the small size of the community patches, mapping of the distinct patches was not feasible. From an ecological perspective, the complexes should be considered a single community. The complex could generally be characterized as having scattered oak and hickory trees and grassy ground cover, with scattered patches of dense prickly ash and gray dogwoods. Typically, red ash dominated areas occurred near small depressions throughout the complexed community, creating SWD2-2 pockets.

The complexed community contains areas of trees that are sparse and open, interspersed with areas of dense shrub thicket, throughout which the existing road system is found. Overall tree cover is approximately 30% in the treed alvar, with relatively stunted trees (3-6 m high). The deciduous swamp had an open canopy (35%) with trees generally 3-6 m in height. This contrasts with sparse tree cover in the shrub alvar (approximately 5%). The soils and site conditions in the Subject Property create naturally limiting factors for woodland habitat.

As a result of the Ecological Land Classification site investigations, corrections were made to the records review for woodlands (**Table 3.3, Appendix B**). The woodland boundary was revised based on ELC (see **Figure 3.0, Appendix A** and **Table 3.4, Appendix B**) and is shown on **Figure 2.0, Appendix A**.

3.3.5 Wildlife Habitat

Over the course of site investigations, seven species of amphibian, five reptiles, 48 breeding birds and thirteen mammals were observed in the Subject Property. A full list of species is provided in **Appendix J**. The majority of species found within the Subject Property are ranked S5 (i.e., secure - common widespread and abundant) or S4 (apparently secure—uncommon but not rare) in Ontario.

Detailed results and analysis of the bird work program are provided in the **Ostrander Point Wind Energy Project Bird Report (Appendix E)**. Detailed results from the bat study are available in the **Ostrander Point Wind Energy Park Acoustic Bat Monitoring Report (Appendix F)**. Summaries are provided in the relevant sections below.

Results of the site investigation program are provided below to identify natural features associated with the Project location. The results are considered within the context of criteria for significant wildlife habitat as outlined within the Significant Wildlife Habitat Technical Guide (MNR, 2000) in order to determine whether the Project location supports candidate significant wildlife habitat.

3.3.5.1 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The Significant Wildlife Habitat Technical Guide identifies 14 potential types of seasonal concentration areas. Only the best examples of these concentration areas are typically considered significant wildlife habitat. Areas that support a species at risk, or where a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which are typically considered significant.

The 14 types of seasonal concentrations are:

1. winter deer yards;
2. moose late winter habitat;
3. colonial bird nesting sites;
4. waterfowl stopover and staging areas;
5. waterfowl nesting sites;
6. shorebird migratory stopover areas;
7. landbird migratory stopover areas;
8. raptor winter feeding and roosting areas;
9. Wild Turkey winter range;
10. Turkey Vulture summer roosting areas;
11. reptile hibernacula;
12. bat hibernacula;
13. bullfrog concentration areas; and,
14. migratory butterfly stopover areas.

Published resources and the results of the field investigation program confirm that the majority of these types of wildlife habitats are absent in the Subject Property.

Site specific investigations indicate that the Subject Property does not serve as an important site for: nesting waterfowl, wintering raptor and Wild Turkeys, Turkey Vulture summer roosts or colonial bird nesting (see **Ostrander Wind Energy Project Bird Report, Appendix E**).

Although evidence of onsite deer use was observed, large numbers were not observed during winter site investigations (see **Table 3.2, Appendix B**) and the site was not considered to be a deer yard area.

No bat hibernacula features were identified through the site investigations (i.e. karst topography, abandoned mines, forested ridges). No maternity roosts were identified through the records review during site investigations. Depending on the species, maternity roosts for bats can include tree foliage, tree cavities and crevices under loose bark, under shutters or shingles, in buildings or between rocks. ELC site investigations confirm that the Subject Property contains open woodland, wetland and is located adjacent to the Lake Ontario shoreline. As noted in **Table 3.4, Appendix B**, woodland habitat in the Subject Lands is typically sparse and stunted. Growing conditions are considered limited as a result of the shallow soils overlaying bedrock. Information from site investigations (ELC, vegetation surveys and wildlife habitat assessments, see **Tables 3.1 and 3.2, Appendix B**) concluded that tree foliage, cavities, snags, hollow trees or trees with large slabs of loose bark; features that may support small maternity colonies of bats are limited or absent from the Subject Property. The Subject Property was not determined to contain candidate Significant Wildlife Habitat for seasonal concentration areas for bats. Bat use of the Subject Property is detailed in **Appendix F**.

Shorebirds use small ponds, marshes, flooded agricultural fields and areas containing mudflats for staging and foraging, Site investigations determined that the Subject Property does not contain suitable habitat for shorebird foraging or staging. The shoreline is an exposed energetic environment and shoreline habitat is composed of large cobble substrate. . Site investigations were undertaken to determine use of the Subject Property and adjacent waters for inland foraging and offshore waterfowl staging areas. During waterfowl foraging surveys the numbers of inland foraging waterfowl observed in the Subject Property ranged from 0 – 2 individuals (see detailed methods and results in **Appendix E, Section 3.3**). ELC field investigations confirmed that the Subject Property is comprised primarily of shrubland, which does not provide suitable habitat for inland staging waterfowl.

No offshore staging waterfowl were identified within 120m of the Project Location (see detailed methods and results in **Appendix E, Section 3.3**). Although the records review indicated the shoreline of Prince Edward County was identified as a significant site for waterfowl, targeted field surveys to monitor use of the Subject Property and adjacent offshore areas for these purposes concluded that this function is not supported within 120m of the Project Location (**Table 3.3, Appendix B**).

A total of 103 species were recorded during spring passerine surveys. Yellow Warbler, Song Sparrow and Brown-headed Cowbird were observed in the highest numbers with 1413, 1156 and 688 individuals recorded respectively. Cedar Waxwing and Chipping Sparrow were also commonly observed (556 and 524 individuals). One species at risk, Golden-winged Warbler, was observed. Golden-winged Warbler is a federally threatened species and a species of special concern provincially.

A total of 120 species were recorded during fall passerine migration surveys. Common Grackle, European Starling and Blue Jay were the most commonly recorded species with 2026, 1489, and 1365 individuals recorded respectively. American Goldfinch and Cedar Waxwing were also commonly observed with 1117 and 887 observations. Two species at risk were recorded: the Short-eared Owl, which is a federal and provincial species of special concern, and the Rusty Blackbird which is a federal species of special concern but not listed provincially.

The record review indicated the Subject Property was a potential seasonal concentration area for migratory landbirds. The results of spring and fall landbird migration monitoring confirm the appropriateness of this. The Subject Property is considered candidate significant wildlife habitat for this function. As a result no corrections to the record review were required (**Table 3.3, Appendix B**).

Surveys for fall migrating raptors indicated that raptor movement occurs over the Subject Property, peaking in early October. The majority of activity occurred above blade height (i.e. greater than 125 metres). Of the total birds observed, 16 (1%) were engaged in localized behavior in the Subject Property, occurring exclusively below blade height. Three species at risk were observed during fall migratory raptor surveys. The Peregrine Falcon is listed provincially and federally as threatened. The Bald Eagle is designated not at risk federally; at the provincial level it is considered special concern. The Golden Eagle is provincially endangered and federally not at risk.

Few species and individuals were observed in the Subject Property during winter and the Subject Property was not concluded to be an important location for wintering raptors or waterfowl (**see Appendix E, Section 3.2 and 3.3**).

Four of the five reptile species observed during site investigations were snakes and included Eastern Gartersnake, Smooth Greensnake, Brown Snake and Northern Watersnake. Snake hibernacula features such as buried concrete or rock (e.g. building foundations, culverts), rock crevices or animal burrows were absent from the Zone of Investigation and it did not support candidate significant wildlife habitat for reptile hibernacula. This correction to the results of the records review was made based on the results of the site investigation program (**Table 3.3, Appendix B**).

No bullfrogs were recorded in the Subject Property (**see Table 3.5, Appendix B**).

The site investigations conducted in the Subject Property did not indicate the presence of additional features that would be considered candidate significant wildlife habitat (Wild Turkey winter range, Turkey Vulture summer roosting area).

Large numbers of Green Darners were noted on one fall raptor survey, and several migrating Monarchs and swallowtail species were observed during fall surveys. However, despite 25 days of fall raptor surveys in 2006 and 2009, and daily surveys conducted by Acadia between August 12 and October 28, 2008, Monarchs were not noted in any substantial numbers. The Subject Property was not determined to be candidate significant wildlife habitat in the form of a butterfly stopover site.

3.3.5.2 Animal Movement Corridors

Movement corridors are areas that are traditionally used by wildlife to move to one habitat from another. This is usually in response to different seasonal habitat requirements. Some examples are trails used by deer to move to wintering areas, and areas used by amphibians between breeding and summering habitat.

The Prince Edward County South Shore IBA is identified for migratory raptors (IBA, undated) and Prince Edward Point has been recognized as a major concentration area for fall migrating Northern Saw-whet Owls (Wilson and Cheskey, 2001).

The results of the field program indicate that raptors migrate over the Subject Property during fall migration, and it is presumed that Saw-whet Owls pass over the Subject Property as well. Criteria for bird migration corridors have not been defined in the SWHTG. However, because the individuals observed were not using habitat within the Subject Property for staging during migration, and the majority of movement occurred more than 125 meters above the Subject Property, raptors are not expected and do not appear to rely on the habitat on the Subject Property for migration. As a result, no significant wildlife habitat in the form of animal movement corridors were identified in the Subject Property. Candidate SWH for amphibians is addressed in section 4.2.5.2.

3.3.5.3 Rare or Specialized Habitats

Rare Habitats

Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the “state”, or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (i.e., extremely rare to rare – uncommon in Ontario), as defined by the Natural Heritage Information Centre (NHIC), could qualify as rare habitats.

Figure 3, Appendix A and Table 3.4, Appendix B summarize the vegetation communities found on site. A list of the vascular plants identified within the Subject Property is found in

Appendix H. Ecological Land Classification field sheets are provided in **Appendix G**. A photo log showing various communities in the Subject Property is found in **Appendix I**.

The soils of the Subject Property were typically 15 to 20 cm in depth comprised of fine textured soils with no development of soil horizons. In some areas, the soils contained an abundance of stones, often forming a layer of cobble stone on the soil surface. Generally, these areas with abundant cobble stones represented drier portions of the Subject Property, characterized by red cedars (including shrub and treed alvar) and sparse ground cover.

Although a number of invasive, non-native plants were observed, the vascular plant community contained plant species characteristic of alvar habitat, that is, those that are tolerant of flood and drought conditions. Alvar community types present in the Subject Property included open alvar, shrub alvar and woodland alvar.

Alvar community types naturally occur in patchy and complex landscape mosaics (Reschke, et al., 1999). This is true of the Subject Property, where vegetation communities often occur as a complex. The most common complexes involved deciduous communities including shrub alvar, treed alvar and swamp which frequently occurred as a complex patchwork.

As recommended in the ELC for Southern Ontario (Lee et al., 1999), many alvar communities were complexed as they formed a pattern of two or more vegetation types in a mosaic that could not be mapped at the site level of resolution. However, from an ecological perspective, the complexes should be considered a single community. The ALS1-4 / ALS1-5 complex, for example, consisted of scattered red cedar and low dogwoods, throughout which were dense thickets of prickly ash and taller dogwood. The dense thickets were relatively small, averaging approximately 100 m² in size. However, combined they covered approximately 30 to 40% of the complex community.

The site investigation confirmed that candidate significant wildlife habitat meeting the criteria of rare habitats (alvar) was present within 120m of the Project Location. No corrections were made to the results of the record review as a result (**Table 3.3, Appendix B**)

Several of the plant species observed were suited to alvar habitat and are tolerant of wet conditions in the spring and drought conditions during summer. Four of these species are recognized as indicators of alvar habitat in southern Ontario; tufted hairgrass, early buttercup, wiry panic grass and false pennyroyal (MNR, 2000). These species have correspondingly high coefficients of conservatism, representing a strong fidelity to specific habitat characteristics. The locations of these species are shown on **Figure 3 (Appendix A)**.

Specialized Habitats

Specialized habitats are microhabitats that are critical to some wildlife species. The SWHTG identifies the following potential specialized habitats:

- habitat for area-sensitive species;
- forests providing a high diversity of habitats;
- old-growth or mature forest stands;
- foraging areas with abundant mast;
- amphibian woodland breeding ponds;
- turtle nesting habitat;
- specialized raptor nesting habitat;
- moose calving areas;
- moose aquatic feeding areas;
- mineral licks;
- mink, otter, marten, and fisher denning sites;
- highly diverse sites;
- cliffs; and
- seeps and springs.

The site investigations confirmed that three of the above specialized habitats occur to some degree on the Subject Property: habitat for area-sensitive species, turtle nesting habitat and amphibian woodland breeding ponds.

Four area sensitive avian species were using the woodland located on the Subject Property based on site investigations (Black-and-white Warbler, prefers 100 ha; Ruffed Grouse, Scarlet Tanager and White-throated Sparrow prefer 20 ha). One was using open habitat (Northern Harrier, prefers 55 ha). One Black-and White Warbler, one Scarlet Tanager and two White-throated Sparrows were recorded during point count surveys. Ruffed Grouse was recorded incidentally during site investigations. These species are ranked S5 or S4 in Ontario (Secure or Apparently Secure). The woodland on the Subject Property provides limited interior habitat and tree growth is considered sparse and stunted. The woodland is currently fragmented by the unmaintained road system that exists on the Subject Property. Given the limited number of area-sensitive species and individuals the Subject Property is not considered to provide candidate significant wildlife habitat for the criteria of area-sensitive species (**Table 3.3, Appendix B**).

Blanding's Turtle nesting habitat is present within the Subject Property. This is being addressed separately under the requirements of the Endangered Species Act (2007). See the **Ostrander Point Wind Energy Park Blanding's Turtle Habitat Assessment (Appendix D)**.

Seven species of amphibians were recorded in the Subject Property. Spring Peeper, Western Chorus Frog, American Toad, Northern Green Frog, Northern Leopard Frog and Grey Treefrog were recorded on amphibian call count surveys. Spotted Salamander larvae were observed during reptile surveys. All species are ranked S5 (i.e., secure - common widespread and abundant) or S4 (apparently secure—uncommon but not rare) in Ontario. The Great Lakes-Shield population of the Western Chorus Frog has been recommended for threatened status by COSEWIC, but this ranking has not been adopted by Environment Canada's Canadian Wildlife Service. Provincially, the species is considered to be one population and has been assessed by COSSARO as not at risk with healthy populations occurring in many areas in southern Ontario (COSSARO, 2009). No other nationally or provincially or regionally significant species were encountered.

The Subject Property generally consisted of grassy and shrubby vegetation communities with areas of open woodland. The shallow soil over bedrock results in poor drainage, which creates pooling water in the spring that appears to persist into early summer. The pooling of water occurs throughout the Subject Property, but is concentrated along the roadways which have been excavated/eroded below grade. These pools create habitat for early breeding amphibians, specifically Spring Peepers, Chorus Frogs and American Toads which were breeding throughout the Subject Property. Northern Leopard Frogs and Grey Treefrogs were less common, occurring in some of the deeper pools. Amphibian activity was observed at every monitoring station during the first round of surveys in April and all but station 10 and 12 during the second round in May. During the last round of surveys in June, amphibian calling was limited to Green Frogs and Grey Treefrogs in areas where surface water persisted, specifically the swamp complex along the eastern boundary of the Subject Property and the graminoid marsh/thicket swamp in the southeast portion of the Subject Property along the lakeshore. Detailed results for each station are provided in **Table 3.5, Appendix B**. The results of the site investigation indicate that the Subject Property supports candidate significant wildlife habitat for amphibian breeding habitat (**Table 3.3, Appendix B**).

Site investigations (ELC, wildlife studies and bird studies [**Appendix E**]) determined that no additional candidate specialized habitats were present within the Subject Property.

3.3.5.4 Species of Conservation Concern

Rare Species (other than Threatened or Endangered)

Western Chorus Frog was recorded breeding on the Subject Property. As noted above, provincially, the species is considered to be one population and has been assessed by COSSARO as not at risk with healthy populations occurring in many areas in southern Ontario (COSSARO, 2009). However, COSEWIC has split the species into two populations with the Great Lakes-Shield population (occurring at this site) of the Western Chorus Frog

recommended for threatened status. This ranking has not been adopted by Environment Canada's Canadian Wildlife Service and Chorus Frog is not included on a SARA schedule. Moderate numbers of Chorus Frogs were recorded at amphibian survey stations (from an estimated 0-50 individuals, median = 3). The Subject Property contains a healthy population of breeding Chorus Frogs, but the number of individuals is not considered significant and the Subject Property is not considered to be candidate significant wildlife habitat based on the presence of this species.

Four designated species at risk were observed during migration:

- one Golden-winged Warbler (federally threatened and a species of special concern provincially) was observed during spring migration.
- one Short-eared Owl, (a species of special concern federally and provincially) was observed during fall migration.
- 179 Rusty Blackbirds (a species of special concern federally, but not listed provincially) were observed during fall migration.
- four Bald Eagles (not at risk federally, special concern provincially) were observed flying over the Subject Property during the 2006 fall raptor migration study and 34 were observed during the 2009 fall raptor migration study. Eighty percent of Bald Eagles recorded during 2009 surveys were flying above blade sweep height (i.e. greater than 125 m).

None of these four species were identified as breeding or wintering in the Subject Property.

Four species assigned a low S-rank were also recorded in the Subject Property: Eastern Pipistrelle and Northern Long-eared Bat (ranked S3?; vulnerable, rank uncertain), Caspian Tern (S3, vulnerable) and rigid sedge (S3, vulnerable). Very small numbers of Northern Long-eared Bat (8) and Eastern Pipistrelle (14) were recorded in the Subject Property over the duration of the bat study period in 2008 and 2009. Caspian Tern was observed flying over the Subject Property and was not considered to be breeding onsite.

Given the small numbers of these species and the transitory presence through the site, the Subject Property is not considered candidate significant wildlife habitat based on the presence of species at risk or low S-rank species.

Pockets of rigid sedge were found throughout the alvar communities, associated with low depressions. The Subject Property is not considered to host a large population of this species and the Subject Property is not considered to be a critical site within southern Prince Edward County for ensuring the long-term survival of the species. Rigid sedge was not identified within the Project Location or 120 m Zone of Investigation.

Declining Populations

Priority species identified by Ontario Partners in Flight (Ontario PIF, 2006) that were recorded breeding in the Subject Property include declining grassland species, forest species and shrub/successional species. The decline of grassland birds has been identified as a conservation concern (Cadman et al., 2007).

The most abundant breeding bird species in the Subject Property, as determined by an analysis of point count data were: Song Sparrow (7.71 pairs/10ha), Yellow Warbler (5.36 pairs/10ha), Field Sparrow (3.52 pairs/10ha), Clay-coloured Sparrow (2.68 pairs/10ha) and Brown Thrasher (2.51 pairs/10ha). This is reflective of the predominance of shrub composition of the Subject Property (see **Figure 3, Appendix A and Table 3.4, Appendix B**). The Subject Property provides approximately 208 ha of shrubland. Targeted surveys for American Woodcock and Wilson's Snipe indicated both species were also common breeding species in the Subject Property, with densities of 7.0 and 4.8 pairs/10ha respectively.

Shrub-successional priority species identified by Ontario Partners in Flight (Ontario PIF, 2006) that were recorded breeding in the Subject Property included Black-billed Cuckoo, Willow Flycatcher, Brown Thrasher, Field Sparrow and Eastern Towhee. The Subject Property is considered to provide candidate significant wildlife habitat for declining shrub/successional breeding bird species (**Table 3.3, Appendix B**).

Five priority grassland/agricultural species (Northern Harrier, Eastern Kingbird, Savannah Sparrow, Grasshopper Sparrow, and Eastern Meadowlark) were observed breeding within the Subject Property. These species are all ranked S5 or S4 in Ontario (Secure or Apparently Secure). Open grassland habitat in the Subject Property is limited to four small patches of open meadow. Grassland species were recorded in very low numbers. Savannah Sparrow, Eastern Kingbird and Northern Harrier were observed in densities of 0.84, 0.67 and 0.17 pairs/10 ha respectively. Grasshopper Sparrow and Eastern Meadowlark were not common enough to be recorded on point counts; incidental observations of these species were recorded during breeding bird area searches on the Subject Property. Notable grassland indicator species such as Bobolink, Vesper Sparrow and Upland Sandpiper were absent from the Subject Property. As a result, the Subject Property is not considered candidate significant wildlife habitat for declining grassland breeding bird species (**Table 3.3, Appendix B**).

Three priority forest species (Northern Flicker, Wood Thrush and Baltimore Oriole) were observed breeding in the Subject Property during site investigations. These species are all ranked S4 in Ontario (Apparently Secure). A total of one Northern Flicker, one Wood Thrush, and three Baltimore Oriole were observed during breeding bird site investigations. Given the low numbers of PIF forest priority species and individuals observed in the Subject Property and the sparse, patchy and stunted nature of the woodland habitat provided within the Subject Property, it is not considered candidate significant wildlife habitat for declining forest breeding bird species.

3.3.5.5 Summary

Based on the results of the field investigations, the following candidate significant wildlife habitat features are present in or within 120m of the Project Location, requiring an evaluation of significance:

- Seasonal Concentration Areas (migratory landbirds);
- Rare Habitats (alvar); and
- Specialized habitats (amphibian breeding habitat),
- Species of Conservation Concern (declining shrub/successional breeding bird species).

3.4 APRD REQUIREMENTS

3.4.1.1 Fish Habitat

The watercourse in the southeast corner of the Subject Property (unnamed) is the only permanent watercourse within the Subject Property. During field assessments, no fish were observed or captured within the unnamed watercourse. The unnamed watercourse is part of a greater wetland complex; however, Jacques Whitford and Stantec field personnel noted there is no direct access to Lake Ontario due to the approximate 1 m change in elevation with a steep slope between Lake Ontario and the location of the watercourse. As a result, the watercourse appears to have low productive capacity for local fish populations and is assessed as having low-quality, seasonal, Type 3 fish habitat.

The standing water in the northeast portion of the Subject Property is best classified as a roadside pool collecting rain and runoff from the adjacent South Bay Coastal Wetland. There are no culverts or other evidence (e.g. channel) of water flowing from this area to a downstream area. Substrates were dominated by muck and detritus with silt and gravel. Instream cover was 60% and consisted of large and small organic debris and terrestrial vegetation. This feature was 100% pool with a maximum estimated depth of 20 cm and exhibited no flow. Canopy cover was 90% open and consisted of juniper, shrub species, black ash, sphagnum species, grasses and common meadow species. Adjacent land use was wetland, flood plain, and scrub land throughout the surrounding areas. The standing water was electrofished during the site investigations with four central mudminnow captured and two others observed but not captured. As this standing water supports fish, it would be considered as Type 2 habitat. The shallow overburden also causes areas of the Subject Property to be seasonally flooded. Generally, these flooding events do not create aquatic habitat, but in some small areas, the surface water is maintained long enough to facilitate the colonization and maintenance of aquatic vegetation and associated fauna. However, these ponds do not support fish species due to seasonal drying and isolation from sources of fish migration.

3.4.1.2 Threatened and Endangered Species

No endangered species were found breeding in the Subject Property during field investigations. Targeted surveys for Henslow's Sparrow did not find the species or suitable breeding habitat (see the Ostrander Bird Report, **Appendix E**).

Site investigations confirmed the presence of two threatened species breeding within the Project Location including the 120 m Zone of Investigation: Whip-poor-will and Blanding's Turtle.

Blanding's Turtle is designated threatened provincially and federally. The presence of Blanding's Turtle is addressed separately in the **Ostrander Point Wind Energy Park Blanding's Turtle Habitat Assessment (Appendix D)**. During site investigations in 2009, a total of five Blanding's Turtle observations were made, three of individual turtles and two of tracks observed at the edge of flooded depressions. In addition to these observations, two Blanding's Turtles were observed by Stantec during fieldwork in 2008 and four observations were made by Jacques Whitford during fieldwork in 2006. Blanding's Turtle is ranked S3 in Ontario (vulnerable) and is designated threatened provincially and federally.

Whip-poor-will is a provincially and federally threatened species that has general habitat protection under the ESA (2007). It was recorded in the Subject Property during its migration period in 2009. Additional studies in 2010 confirmed the species as breeding within the Project Location and 120 m zone of investigation. The 2009 results were addressed in the **Ostrander Point Wind Energy Park Whip-poor-will Habitat Assessment (Appendix D)**. Results from 2010 surveys have been submitted to MNR and are being addressed under the Endangered Species Act.

A single Peregrine Falcon (provincially and federally threatened) was observed overhead during each of the 2006 and 2009 fall raptor migration studies. The bird observed in 2009 was flying at approximate blade height. Peregrine Falcon are not believed to be breeding in the Subject Property.

Two Golden Eagles (provincially endangered and federally Not at Risk) were observed flying well above blade height (i.e. over 150 m) during 2009 fall migration surveys. No observations of Golden Eagles were made in the Subject Property during the winter raptor surveys. The species was not considered to be breeding or wintering in the Subject Property. The results of additional studies undertaken September-November 2010 to survey Golden Eagles concluded that the Ostrander Subject Property was not used for foraging or staging Golden Eagles during fall migration. Petroleum Resources

No petroleum resources were identified within Project Location or Zone of Investigation through the records review or site investigations.

3.4.2 Hazard Lands

No hazard lands were identified within Project Location or Zone of Investigation through the records review or site investigations.

3.4.3 Crown Forest Reserves

No Crown Forest Reserves were identified within Project Location or Zone of Investigation.

3.4.4 Mineral Aggregate Resources

No mineral aggregate resources were identified within Project Location or Zone of Investigation through the records review or site investigations.

3.5 QUALIFICATIONS

The following Stantec personnel were responsible for conducting the site investigations:

Name	Site Investigation Role
Valerie Wyatt, Senior Project Manager	Study design; field surveyor
Nicole Kopysh, Project Manager	Lead – bird studies; field surveyor
Andrew Taylor, Ecologist	Lead – all other wildlife studies, vegetation and wetland studies; field surveyor
Brandon Holden, Ecologist	Field surveyors – birds
Jon Pleizier, Ecologist	
Jill Crumb, Ecologist	Field surveyors- reptiles
Shannon Catton, Ecologist	

Curricula vitae are provided in **Appendix K**.

4.0 Evaluation of Significance

4.1 METHODS

Natural heritage information collected from the records review, the site investigation and consultations were analyzed to determine the significance and sensitivity of existing ecological features and functions. For all natural features existing in, or within 120 m of the Project Location, a determination was made of whether the natural feature is provincially significant, significant, not provincially significant or not significant.

Wetlands, life science ANSIs and earth science ANSIs were treated as provincially significant if they had been identified as such by MNR. This information was obtained from NHIC and through correspondence with the local MNR District. Non-provincially significant wetlands are those that have been evaluated but did not receive sufficient points to be considered significant. Wetlands that have yet to be examined are termed unevaluated. Wetland and ANSI features not evaluated by MNR were assessed using evaluation criteria or procedures established or accepted by MNR.

Valleylands, wildlife habitat and woodlands were considered to be significant if MNR has identified them as such, or when evaluated as significant using procedures established by MNR.

Comments received from MNR (March 8, 2010) and from Environment Canada (February 24, 2010) were used to assist in the evaluation of significance (**Appendix C**).

Procedures used in the evaluation of significance for the natural features within the Subject Property included:

- Ontario Wetland Evaluation System (MNR, 2002);
- Natural Heritage Reference Manual (MNR, 2010); and
- Significant Wildlife Habitat Technical Guide (MNR, 2000).

Global, national and provincial status of wildlife and plants was provided by the Natural Heritage Information Centre. Status rankings are primarily based on the number of occurrences within each respective jurisdiction.

Provincial designations for endangered, threatened and special concern species were obtained from the most recent Committee on the Status of Species at Risk in Ontario (COSSARO) assessments and consideration of species and habitat protection was determined according to the *Endangered Species Act* (ESA, 2007). Federally, designations for endangered, threatened and special concern species were obtained from the most recent Committee on the Status of

Endangered Wildlife in Canada (COSEWIC) assessments and the schedules of the *Species At Risk Act* (SARA) were used to determine species protection.

The natural features to be considered in the Evaluation of Significance (O.Reg 359/09, s. 27) are identified in **Section 1.2** of this report. With regard to the Subject Property, the natural features present on and within 120 m of the Project Location, and requiring an evaluation of significance include:

- Wetland and coastal wetlands
- Woodland
- Candidate significant wildlife habitat:
 - o Seasonal Concentration Areas (migratory landbirds);
 - o Rare Habitats (alvar);
 - o Specialized habitats (amphibian breeding habitat, and
 - o Species of Conservation Concern (declining shrub/successional breeding bird species).

These are shown on **Figure 2, Appendix A** and evaluated in the following sections.

4.2 RESULTS

4.2.1 Wetlands and Coastal Wetlands

No components of the Project are found within provincially significant wetland features.

Small portions of the provincially significant South Bay Coastal Wetland extend into the northern portion of the Subject Property and fall within the 120 m Zone of Investigation from the Project Location. This feature was designated provincially significant by MNR and as such is considered to be provincially significant for the purposes of this evaluation.

Unevaluated wetland is found in the southeastern corner of the Subject Property. One turbine and a portion of access road fall within 120 m of this feature. This wetland was evaluated using procedures outlined within the OWES (2002). A wetland evaluation, data and scoring record were completed for the feature and are included in **Appendix G**.

The 23 ha wetland is comprised of two communities; a Red Ash Mineral Deciduous Swamp and a Broad-leaved Sedge Mineral Shallow Marsh. Although there was no apparent surface water connection from the meadow marsh to the lake, it is directly adjacent to Lake Ontario, and is considered an undisturbed coastal wetland. Similar undisturbed marshes are increasingly rare along the Great Lakes (Bland, 1997). Patches of open water occurred within the marsh. No rare species of vegetation were identified within the communities; however the wetland feature is known to provide year round habitat for Blanding's Turtle, a provincially and federally threatened species. It also hosts populations of breeding amphibians (further assessed in **Section 4.2.5.3**) and plays a function for the stopover of migratory landbirds (further assessed in **Section 4.2.5.1**). Given its size, coastal connection and the biological components it supports, this wetland is considered to meet the criteria to be considered a provincially significant coastal wetland (OWES, 2002).

Provincially significant wetland (PSW) is shown on **Figure 4, Appendix A**.

4.2.2 Areas of Natural and Scientific Interest (ANSIs)

The Project is located within the Candidate Provincially Significant Life Science ANSI. MNR correspondence indicates that the ANSI status is currently unconfirmed and therefore an evaluation of significance is not required and the feature is not subject to development prohibitions or setbacks (MNR, March 8, 2010).

No Earth Science ANSIs were identified within the Project Location or Zone of Investigation through the records review or site investigations.

4.2.3 Valleylands

No valleylands were identified within Project Location or Zone of Investigation through the records review or site investigations.

4.2.4 Woodlands

The local planning authority is responsible for designating significant woodlands. Prince Edward County has not developed a definition of significant woodland or defined their boundaries (PEC Official Plan, 2008).

In the absence of defined local criteria for the determination of significant woodlands the provincial guidelines of the Natural Heritage Reference Manual (NHRM) (MNR, 2010) were used to assess the significance of the woodland. Criteria suggested by the NHRM for designating significant woodlands include woodland size, ecological function, uncommon woodland characteristics and woodland economic and social value. In the case of woodland size, the suggested criteria changes depending on the amount of forest cover in the planning area. For instance, where there is less than 5% forest cover, it is suggested that woodlands 2 hectares in area or larger should be evaluated for significance compared to 4 hectare woodlots

in areas with 5% to 15% forest cover, and 20 hectare woodlots for areas with 15 to 30% forest cover.

According to Riley and Mohr (1994), Prince Edward County contains approximately 14.2% woodland cover. Based on the NHRM woodlands equal to or greater than 4 ha in size should be considered for significance.

4.2.4.1 Size

The Subject Property contains approximately 89 ha of woodland communities. Woodland communities include treed alvar, deciduous swamp and thicket swamp. Though these communities contain areas of trees that are sparse and open, interspersed with areas of dense shrub thicket, for the purposes of this analysis the entire community was conservatively considered to meet the definition of woodland (i.e. 1,000 trees of any size, 750 trees over 5 cm in diameter, 500 trees over 12 cm, 250 trees over 20 cm, *O.Reg359/09*). Although the woodland communities found within the Subject Property are separated from the woodland that extends to the north (as part of the South Bay Coastal PSW) and east by roads, they were considered part of the same woodland.

As noted above, for areas with 5%-15% forest cover, woodlots over 4 ha in size are considered significant. Based on the size criteria outlined in NHRM, the woodland is considered significant.

4.2.4.2 Ecological Function

The woodland community contains areas of trees that are sparse and open, interspersed with areas of dense shrub thicket, throughout which the existing road system is found.

Representative photographs of the woodland community are shown in **Appendix I** and ELC cards are provided in **Appendix G**.

Overall tree cover is approximately 30% in the treed alvar, with relatively stunted trees (3-6 m high). Dominant species were bur oak and shagbark hickory. The deciduous swamp had an open canopy (35%) with red ash dominant. Trees were generally 3-6 m in height. This contrasts with sparse tree cover in the shrub alvar (approximately 5%), consisting predominately of red ash. Supporting habitat features such as snags and deadfall were not observed in the treed alvar and shrub alvar, but were considered rare in the deciduous swamp. The southern third of Prince Edward County contains limestone bedrock which is covered by a shallow layer of soil. The soils and site conditions in the Subject Property create naturally limiting factors for woodland habitat.

Woodland Interior- Due to the patchy, stunted and sparse nature of the trees contained within the woodland found in the Subject Property, it provides limited interior habitat (i.e., >100 metres from the edge). This is confirmed by the limited number and low abundances of interior forest species recorded during site investigations

Proximity to other woodlands - Woodland is found immediately to the north and the east of the Subject Property.

Linkages - the woodland is considered part of a natural heritage system; it is connected to provincially significant wetland and is located in close proximity to other woodland features.

Water protection - the woodland is not located within a sensitive or threatened watershed, and is not located near a recharge, discharge, headwater area, watercourse or fish habitat.

Diversity - The site does not meet the criteria for woodland diversity. It does not contain a composition of native forest species that have declined or have a high native diversity of community types or terrain.

Wildlife Functions

Four area sensitive avian species were using the woodland located on the Subject Property based on site investigations (Black-and-white Warbler, requires 100 ha; Ruffed Grouse, Scarlet Tanager and White-throated Sparrow require 20 ha). One Black-and White Warbler, one Scarlet Tanager and two White-throated Sparrows were recorded during point count surveys. Ruffed Grouse was recorded incidentally during field investigations.

As noted above, due to the patchy, stunted and sparse nature of the trees contained within the woodland found in the Subject Property, it provides limited interior habitat (i.e., >100 metres from the edge). This is confirmed by the limited number and low abundances of interior forest species recorded during site investigations. Given the limited number of species and individuals using the woodland, it is not considered to provide a significant function of supporting area-sensitive species.

Recent radar studies in the Great Lakes Basin characterized landscapes used by migratory birds for stopovers. The research showed that migrants select forested areas in close proximity to water (Bonter et al., 2008). Similarly, Ewart et al. (2006) ranked relative importance of attributes associated with stopover sites associated with migrating landbirds in the Western Lake Erie Basin. The results of this analysis indicated that landbirds may be particularly concentrated in riparian woodland located within 0.4 km of the lakeshore. Spring and fall migration studies conducted by Acadia within the Subject Property support this, indicating that passerine migrants use the woodland in the Subject Property for this function. Migratory landbirds are further discussed in relation to Significant Wildlife Habitat: Seasonal Concentration Areas, in **Section 4.2.5.1**.

A targeted program is conducted each fall for Saw-whet Owl at Prince Edward Point Bird Observatory (PEPtBO) using audio lures that bring individuals to ground level. Weir (1980) hypothesized that most of the Northern Saw-whet Owls arrive at Prince Edward Point via a land route from the mainland moving eastward down the peninsula. He also hypothesized that most owls do not cross Lake Ontario, but instead backtrack westward upon reaching the point.

Sandilands (2010) notes that the birds tend to concentrate along the northern shore of Lake Ontario suggesting that they may fly directly over the lake. The exact route by which Northern Saw-whet Owls arrive and leave Prince Edward Point remains unconfirmed. Little is known regarding the migration height of the owls as the radar technology used to survey migrants at night during normal migration activities at relevant heights is not capable of separating Northern Saw-whet Owls from other species. There is no evidence to indicate Saw-whet Owls concentrate in the Subject Property, but given the numbers recorded at PEPtBO, there is the potential for the owls to use the woodland within the Subject Property as a migration stopover. During migration, the Saw-whet Owl may use coniferous, mixed and deciduous forests, but can also be found in isolated groves of trees, shrubby areas along shorelines, city parks and treed residential areas (Sandilands, 2010).

Though Ostrander Point Road intersects the main portion of woodland in the Subject Property from the larger woodland to the east, these two areas were considered to be connected for the purposes of this analysis. Small fingers of swamp that extend into the northern portion of the Subject Property are considered part of the South Bay Coastal Wetland PSW though separated from the main feature by Helmer Road.

The woodland is considered a disturbed system due to the network of unmaintained roads that currently fragment the habitat. The use of this road network, and off-roading by recreational users of the Subject Property is considered to cause degradation to the vegetation and disturbance and potential mortality to the wildlife inhabiting the woodland.

The red ash mineral deciduous swamp located on the Subject Property supported a healthy population of amphibians; stations 3 and 4 supported good numbers and a diversity of species (see **Figure 3, Appendix A**). This community is also considered to provide year round habitat for the federally and provincially threatened Blanding's Turtle. The red ash mineral deciduous swamp community present in the Subject Property was considered to provide a significant ecological function to the landscape based on the provision of amphibian and reptile habitat.

4.2.4.3 Uncommon Woodland Characteristics and Woodland Economic and Social Value

The woodland area type is comprised in part of a complexed community containing shrub alvar and treed alvar. MNR indicates that all alvar communities found within Ecoregion 6E are considered provincially rare (March 8, 2010). As such, the woodland area type is considered uncommon. The economic and social value of the woodland is low, as it is not used for syrup production or forestry. Some recreational use does occur, predominately by users of all-terrain vehicles, but also for hiking, picnicking and hunting.

The woodland located on the Subject Property is considered to fit the criteria of significant woodland as presented in the NHRM based on its size, ecological function and rare vegetation communities. Significant woodland is shown on **Figure 4, Appendix A**.

4.2.5 Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (OMNR, 2000) was used to help decide what areas and features should be considered candidate significant wildlife habitat (see Section 3.3.5). The site investigations determined that the following candidate significant wildlife habitat features are present on or within 120m of the project location, requiring an evaluation of significance:

- Seasonal Concentration Areas (migratory landbirds);
- Rare Habitats (alvar);
- Specialized habitats (amphibian breeding habitat); and
- Species of Conservation Concern (declining shrub/successional breeding bird species).

4.2.5.1 Seasonal Concentration Areas

Migratory Landbirds

The records review indicated that woodland adjacent to the Great Lakes shoreline can serve as an important stopover location for migrating landbirds. Additionally, the Prince Edward County South Shore IBA is identified for migratory landbirds (IBA, undated). Criteria outlined in the Significant Wildlife Habitat Technical Guide (Appendix Q) for evaluation of significance include; the presence of species of conservation concern, the diversity and abundance of species, the size of the site, habitat diversity, historical use and location of the site (i.e. those within 5 km of Great Lakes are most significant).

The Subject Property contains 89 ha of woodland located within 5 km of the Lake Ontario shoreline. The majority of woodland is within 0.4 km from the shoreline, which has been identified as being of particular importance to migrating landbirds (Ewart et al. 2006). Results from Acadia's migratory survey recorded 103 species during spring migration and 120 species during fall migration in the Subject Property. Vireos, thrushes and flycatcher were observed in good numbers during both spring and fall migration (Stantec, 2009b). Warblers, particularly Yellow Warbler, were found in higher numbers during the spring migration period. One species at risk was recorded during spring migration (1 Golden-winged Warbler), while two species at risk were recorded during fall migration (1 Short-eared Owl and 179 Rusty Blackbirds).

Woodland within the Subject Property is considered to provide migratory stopover habitat within the Prince Edward County landscape, although other sites likely provide a more significant function for this criterion, particularly within Prince Edward Point National Wildlife Area.

The woodland within the Subject Property is considered significant wildlife habitat based on the criteria of migratory landbird stopover areas. This feature is indicated on **Figure 4, Appendix A**.

4.2.5.2 Rare or Specialized Habitats

Rare Habitats (Alvar)

Alvar habitat communities were identified in the Subject Property. Alvar communities present include meadow alvar, shrub alvar and treed alvar. Descriptions of each community are provided in **Table 3.4, Appendix B**. Alvar habitat in the Subject Property is shown on **Figure 2 (Appendix A)**. Appendix Q of the SWHTG (MNR, 2000) provides evaluation criteria for the determination of significance and suggested guidelines for these criteria. For rare vegetation communities, these criteria include current representation within the planning area; degree of rarity; diversity of the site; condition of the community; size and location of the site; potential for long-term protection; and provision of significant wildlife habitat.

Current Representation within the Planning Area - The southern third of Prince Edward County contains limestone bedrock which is covered by a shallow layer of soil. The southern location, soil textures, drainage patterns, microclimate and proximity to Lake Ontario have resulted in the development of alvar-like conditions throughout much of this area (Wilson and Cheskey, 2001). The majority of the Subject Property is covered by alvar shrubland. This alvar community type is considered to be well represented within southern Prince Edward County, with potential protection provided within the Prince Edward Point National Wildlife Area and Point Petre Provincial Wildlife Area.

Degree of Rarity - The three alvar community types found within the Subject Property have not been assigned provincial rankings by NHIC. Appendix J of the SWHTG indicates that all alvar communities found within Ecoregion 6E are considered provincially rare. Appendix N of the SWHTG lists plants that are considered indicative of alvar habitat in southern Ontario. Four of the thirty-two indicator species listed were present in the Subject Property: tufted hairgrass, wiry panic grass, early buttercup and false pennyroyal. With the exception of tufted hairgrass, these species are ranked S4 in Ontario (Apparently Secure—Uncommon but not rare). Tufted hairgrass is ranked S4S5 (Apparently Secure- Secure). These species were not found ubiquitously throughout the Subject Property, but rather in a few distinct locations within the Subject Property. The location of these species is shown on **Figure 3, Appendix A**. No provincially or federally rare plant species were recorded in Subject Property. One plant species containing a low S-rank was recorded in the Subject Property; rigid sedge is ranked S3 (vulnerable). It was not found within the Project Location or associated 120 m zone of investigation.

Diversity of the Site - Sites with more than one rare vegetation community, higher plant species diversity and/or supporting a number of rare species are more significant. The Subject Property contains three alvar communities and is not known to support any rare species. The Subject Property is not considered to exhibit a wide range of communities and is not considered to have a high overall ecological diversity. For comparison, Salmon River Alvar, located east of Bellville and considered one of the richest alvars in Ontario, contains at least 31 vegetation

communities, a number of which are considered rare in addition to containing several rare plant species (NHIC, 2009).

Condition of the Community - Undisturbed or least disturbed communities are considered more significant. During World War II the Subject Property became a training site for the Canadian Army and was used for tracked vehicles as well as a bombing range (Wilson and Cheskey, 2001). This has resulted in an unmaintained road system that criss-crosses the Subject Property. Currently, these roads are used by ATV's, hunters and other recreationalists to access the Subject Property. Disturbance from off-road vehicles was cited as being particularly intrusive on the Ostrander Point Crown Land Block (Wilson and Cheskey, 2001). Disturbed communities also include the presence of exotic species (i.e. introduced or not native to Ontario). Twenty-seven percent of species identified within the Subject Property are considered exotic. Species identified as particularly problematic for alvar communities include common buckthorn, honeysuckles and mossy stonecrop (Goodban, undated). Buckthorn was found throughout the Subject Property, with particularly dense concentrations in the ALS1-4 and SWD2-2 communities.

Size and Location of Site - Alvar communities greater than 125 ha are likely to have intact natural processes and good potential viability (Reschke et al., 1999). The Subject Property contains approximately 208 ha of shrub alvar, 19 ha of open meadow alvar and 21 ha of treed alvar/swamp. An additional 53 ha are comprised of communities that include swamp and treed alvar complexes. The Subject Property is generally located within a natural and undeveloped landscape.

Potential for Long Term Protection of the Site - The Subject Property is Crown land and is contained largely within a natural landscape, in part due to the unsuitability of the land for agricultural purposes. MNR notes that the location of alvar on Crown land offers greater opportunity for protection (MNR March, 8, 2010). The Subject Property is contained within a greater natural area found in south Prince Edward County and is located between the peninsula in the Prince Edward Point National Wildlife Area and Crown Land at the Point Petre Provincial Wildlife Area.

Provision of Significant Wildlife Habitat- The majority of plant and wildlife species supported within the alvar communities are considered common or very common in Ontario. The shrubland supports some declining avian species. Additionally, the swamp located along the eastern boundary supports a diverse range and good numbers of breeding amphibians. These items are further addressed below.

Consultation with the MNR (March 8, 2010) indicates that the MNR considers all alvar habitat in Ecoregion 6E to be provincially rare, and the alvar communities on the Subject Property to be significant wildlife habitat due to the potential for long-term protection and the provision of habitat for species of conservation concern .

Specialized Habitats (Amphibian Woodland Breeding)

Amphibian habitat is present within the woodland and swamp communities located on the Subject Property (**Figure 2, Appendix A**). Evaluation criteria provided in Appendix Q of the Significant Wildlife Habitat Technical Guide (MNR, 2000) and Index #40 of the Significant Wildlife Habitat Technical Guide Decision Support System were used in the determination of significance.

Relatively high levels of activity were recorded across the sixteen stations, with stations 3 and 4 supporting multiple species (including both early and late breeding species) and relatively high numbers of individuals (see **Figure 3, Appendix A**, and **Table 3.5, Appendix B**). These areas support breeding populations of Spring Peeper, Chorus Frog, American Toad, Grey Treefrog, Green Frog and Northern Leopard Frog. These species are ranked S5 or S4 in Ontario (secure or apparently secure).

Much amphibian habitat on the Subject Property is located along the unmaintained road network within pools of water that are created by seasonal flooding (see **Figure 2, Appendix A**). These areas provide habitat for early breeding species of amphibian, however they are subject to disturbance by local use of the unmaintained road system. The water that was present early in the season dried out, eliminating the potential for these areas to support later breeding species. No amphibians were recorded during June amphibian surveys at stations located within this feature. The woodland has an open canopy and very little downed woody debris. As a result, this feature does not contain two of the three elements necessary to be considered woodland breeding ponds (Index #40, SWHTG Decision Support System) and is not considered to provide significant wildlife habitat for breeding amphibians.

Stations 3 and 4 are located within the Ash mineral deciduous swamp (SWD2). Unlike most of the Subject Property, water persisted in this community year round. It is also subject to a lesser degree of disturbance than the remaining swamp habitat on the Subject Property as the road network does not enter this community. This community also contained supporting habitat features such as deadfall. As a result, the Ash mineral deciduous swamp was found to support healthy populations of woodland amphibians. It is also considered to provide year round habitat for Blanding's Turtle. As a result, the SWD2 community in the southeast corner of the Subject Property is considered to provide significant wildlife habitat for breeding amphibians (**Figure 4, Appendix A**).

4.2.5.3 Species of Conservation Concern

The most significant criterion for the determination of significant wildlife habitat is evidence of species of conservation concern. This includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe.

Rare species are considered at five levels: globally rare, nationally rare (with designations by COSEWIC), provincially rare, regionally rare (at the Site Region level), and locally rare (in the municipality or Site District). This is also the order of priority that should be assigned to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to habitat loss and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

Species of conservation concern observed in the Subject Property include species at risk (other than endangered and threatened species), species with low S-ranks, and Ontario Partners in Flight (PIF) priority species.

Five shrub/successional species (Black-billed Cuckoo, Willow Flycatcher, Brown Thrasher, Eastern Towhee and Field Sparrow) were observed breeding in the Subject Property. These species are ranked S5 or S4 in Ontario (Secure or Apparently Secure) but are experiencing declines in their populations (Cadman et al., 2007). Densities of shrub species at the Subject Property reflect the predominance of this habitat type within the Subject Property. Song Sparrow (7.71 pairs/10ha), Yellow Warbler (5.36 pairs/10ha), Field Sparrow (3.52 pairs/10ha), Clay-coloured Sparrow (2.68 pairs/10ha) and Brown Thrasher (2.51 pairs/10ha) were the most common species recorded in the Subject Property.

The Subject Property provides approximately 208 ha of shrubland. Areas of the Subject Property were mowed in 1997 as part of a habitat management plan to reduce shrub density and promote grassland (MNR, 2007a). Due to the restricted growing conditions and the shallow soils within south Prince Edward County the shrubland/early successional habitat is considered common throughout this landscape. The Subject Property supports a healthy population of shrub/successional species and is considered to meet the definition of significant wildlife habitat as outlined in Appendix Q of the Significant Wildlife Habitat Technical Guide. Although the Subject Property is considered disturbed from use of the road network of the Subject Property as well as off-road use, the Subject Property provides large areas of suitable habitat and contains increased potential for long term protection from its status as Crown Land.

4.2.5.4 Summary

Significant wildlife habitat is present in the Subject Property. It was identified and designated based on:

- Seasonal concentration areas (migrating landbirds);
- Rare vegetation communities (alvar);
- Specialized habitats (woodland amphibian breeding); and
- Species of conservation concern (declining avian shrub/successional breeding species).

These features are mapped on **Figure 4, Appendix A**.

4.2.6 Provincial parks and conservation reserves

No provincial parks or conservation reserves exist within the Subject Property.

4.3 SUMMARY

This Natural Heritage Assessment was undertaken to identify natural features found within the Ostrander Point Wind Energy Park and evaluate their significance. This report has been prepared in accordance with *O. Reg. 359/09* and the MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (September 2009).

Based on an assessment of background information and the results of on-site field investigations, the following significant natural features were identified in and within 120 m of the Project Location, requiring an Environmental Impact Study (EIS) under O.Reg 359/09 s.38:

- provincially significant wetland;
- significant woodland; and
- significant wildlife habitat.

The Environmental Impact Study is intended to identify and assess any negative environmental effects relating to the Project and develop mitigation measures.

4.4 QUALIFICATIONS

The following Stantec personnel were responsible for the application of evaluation criteria and procedures:

- Valerie Wyatt, Senior Project Manager
- Nicole Kopysh, Project Manager
- Gwendolyn Weeks, Environmental Scientist (wetland evaluation)
- James Leslie, Terrestrial Ecologist (wetland evaluation)

Curricula vitae are provided in **Appendix K**.

5.0 Environmental Impact Study

The Significant Wildlife Habitat Technical Guide (MNR, 2000) and its Decision Support System were used to assist in the evaluation of impacts and mitigation measures as were comments received from MNR (March 8, 2010) and from Environment Canada (February 24, 2010) (**Appendix C**).

The primary mitigation measure employed was to minimize disturbance to the most important habitat features on the Subject Property, and minimize the length of new access roads, which typically are responsible for the largest amount of disturbed footprint during construction (Arnett et al., 2007). Efforts were made to incorporate the current road network at the Subject Property to the greatest extent possible.

5.1 PROJECT OVERVIEW

The basic components of the Project include nine GE xl 2.5 MW wind turbine generators with a total installed nameplate capacity of 22.5 MW, transformers included within each turbine, one on-site substation including transformer and electrical collector lines. This system will transport the electricity generated at the wind farm to Hydro One Networks Inc.'s (Hydro One's) Distribution Network. The Project also includes roads providing access to the turbines for on-going maintenance as well as electrical equipment and systems required for interconnection to the Hydro One grid. The nine-turbine facility is considered to be of small size (i.e. 1-10 turbines) (Environment Canada, 2007a).

Total vegetation removal required for the Project Location will be approximately 6 ha of the 324 ha Subject Property (1.9%). Habitat to be removed consists primarily of alvar shrubland (4 ha) with small portions of open alvar meadow, cultural meadow and treed alvar/swamp complex requiring removal. **Table 5.1, Appendix B** provides a summary of habitat removal required for the Project.

Construction is currently scheduled to start in October 2011 with commercial operation projected to begin in early 2012.

The project components include roads providing access to each turbine site and the substation. The road scope of work provides for approximately 5.4 km of new roads. The roads are approximately 6 meters wide. The underground collector line system follows the roads and is incorporated into the road footprint. No water crossings will be required for the installation of the roads.

A parking lot will be created next to the transformer station that will be used during construction/decommissioning and operation of the Project. The parking lot will be 21 m x 47 m and consist of the same gravel material as the access roads. Fuel storage will likely take place on site. Designated storage unit areas and the type of storage units will be confirmed by the

construction contractor prior to construction (but most likely will be near the transformer substation and parking lot area).

Crane pads (turbine assembly areas) will be constructed at the same time as the roads and will be located adjacent to the turbine location. The general crane pad area will be approximately 20 m x 40 m, and will typically consist of 300 mm Granular A gravel. Once the turbine erection is complete, the crane pads at the base of each turbine will be kept in place throughout the life of the Project for maintenance and decommissioning activities.

The towers will be delivered to the Subject Property in four main sections and will be assembled. There is no designated mass storage area for the turbines and their associated components. Instead, prior to construction each turbine and its associated components will be temporarily placed in close proximity to the turbine base within the temporary laydown areas (approximately 70 m long). These temporary laydown areas will be unimproved lands (e.g. no gravel or excavation required).

All components of the Project and the associated 120 m Zone of Investigation are shown in **Figure 4 (Appendix A)**.

5.2 PROVINCIALY SIGNIFICANT WETLAND AND COASTAL WETLAND

All proposed components of the Project (turbines, roads and underground collector lines, substation location, parking etc.) are located outside of identified PSW boundaries.

The Project layout in relation to PSW boundaries is shown on **Figure 4, Appendix A**. The following components are within 120 m of a PSW:

Project Component	Approximate distance from PSW boundary
Transformer station	80 m
Construction trailer and parking area	75 m
Roads and underground collector lines	25 m at closest point
Turbine #6, crane pad and temporary laydown area	80 m to blade tip 130 m to crane pad, temporary laydown area and turbine base
Turbine #8, crane pad and temporary laydown area	100 m to blade tip and crane pad 75 m to temporary laydown area 150 m to turbine base
Turbine #9, crane pad and temporary laydown area	50 m to blade tip, 80 m to temporary laydown area 100 m to crane pad and turbine base

5.2.1 Potential Effects

All components of the Project are sited outside PSW boundaries, therefore there will be no direct loss of wetland habitat or function. Indirect impacts resulting from construction activities, such as dust generation, sedimentation and erosion, are expected to be short term, temporary in duration and mitigable through the use of standard best practice site control measures. Dust generation is anticipated to be relatively low given shallow topsoil and underlying bedrock. During construction, there will be increased traffic and the potential for accidental spills.

Indirect impacts during construction and operation could include disturbance or disruption to the wetland features and wildlife. The Coastal PSW is known to support breeding woodland amphibians and Blanding's Turtle. The noise of construction will be temporary, and is anticipated to take place outside the sensitive periods for calling amphibians (April-June). Since wind power is a relatively new method of producing electricity, there is little literature on the direct effects of wind turbine noise on wildlife. Only one study is known to deal specifically with wind turbines as the noise emitters, rather than general urban noises (Rabin et al., 2006). Individual reproductive success has been directly related to calling effort in frogs (Sun and Narins, 2004). Therefore, noise emissions are a concern because it can interfere with calling rates, which could in turn impact fitness (Sun and Narins, 2004, Penna et al., 2005). As well, noise may not allow breeding frogs to properly hear and move toward breeding aggregations (Maxell and Hokit, 1999).

Turbine #9 is sited approximately 100 m from turbine centre to the provincially significant coastal wetland that supports significant woodland amphibian populations. Given vibration is $1/5^{\text{th}}$ to $1/100^{\text{th}}$ of the limit of perception within 25 m of the turbine base (Legerton et al., 1996) and that vibration magnitude drops off significantly as distance increases (K. Smith, Aercoustics, pers. comm.) a setback of 100 m is considered to be sufficient to mitigate any noise and vibration effects to amphibians. In addition, the intermittency of wind turbine noise and particularly its absence on calm nights when amphibian calling intensity is greatest, is anticipated to mitigate the potential impacts of turbine noise on wetland wildlife.

Roads and underground collector lines within the north portion of the Subject Property are proposed within approximately 25 m from the PSW boundary. During operation of the facility, some materials such as lubricating oils and other fluids associated with turbine maintenance have the potential for discharge to the on-site environment through accidental spills resulting in a potential impact to wetland through ground or surface water contamination.

5.2.2 PSW - Mitigation

Avoidance was the main strategy used to minimize impacts to PSW within 120 m of the Project Location. Turbines were set back a minimum of 100 m (from turbine base) to PSW boundaries. At one point, an access road and underground collector line will approach within 25 m of the PSW, but areas which will experience the most significant disturbance during construction, such as crane pads and temporary laydown areas, will be located at least 75m from the PSW. Currently, existing roads bisect the PSW unit located at the intersection of Helmer and Babylon

roads. The proposed road and underground collector line will avoid and redirect existing traffic around this unit of the PSW.

Construction will be required within 120 m of the PSW. Wetlands can be particularly sensitive to soil compaction and indirect hydrological effects. The following mitigation measures should be implemented:

- Silt barriers (e.g., fencing) should be erected along wetland edges that occur within 30 m of construction work areas to minimize sediment transport to the wetland. These barriers should be regularly monitored and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation.
- Where possible, and as appropriate, roads should be constructed at or near existing grade to maintain surface flow contributions to the wetland.
- Inspectors should ensure construction vehicles and personnel stay within the demarcated areas, thereby limiting the disturbance of natural vegetation.
- All equipment refueling should occur well away from the wetland. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination should occur in properly protected and sealed areas.

5.2.3 Net Effects

The setback of more than 100m for turbine bases and 75 m for laydown areas/crane pads from PSWs will ensure that there is no material disruption of wetland function and no net loss of wetland area. These separation distances will attenuate disturbance effects due to operational activities including turbine operation and maintenance. At one point, the access road and underground collector line approaches within 25 m of one unit of the PSW, which will allow existing traffic (currently travelling a road that bisects the wetland) to be redirected around the PSW. The mitigation measures described above will ensure no adverse effects to the PSW during construction and operation.

5.3 SIGNIFICANT WOODLANDS

Components of the Project located within significant woodland include:

- Turbine #9, its associated crane pad and temporary laydown area;
- Blade tip area, crane pad and temporary laydown area for turbine #2; and
- Approximately 1km of road and underground collector line.

Additional components of the Project located within 120 m of significant woodland include:

Project Component	Approximate Distance from Significant Woodland Boundary
Turbine #1, crane pad and temporary laydown area	50 m from blade tip 100 m from turbine base 50 m from temporary laydown area, 60m from crane pad
Turbine #2 base	10 m from turbine base
Turbine #3, crane pad and temporary laydown area	80 m to blade tip 120 m to crane pad and temporary laydown area
Turbine #7, crane pad and temporary laydown area	30 m from blade tip 80 m from turbine base 70 m to crane pad and temporary laydown area
Turbine #5, crane pad and temporary laydown area	50 m to blade tip 100 m to turbine base 100 m to crane pad and temporary laydown area
Access road and underground collector line	ranges from 0-120 m within Zone of Investigation

5.3.1 Potential Effects

The Subject Property contains approximately 89 ha of woodland, evaluated as significant using provincial guidance. The woodland is considered significant due to its size, characteristics and functions (landbird migratory stopover areas, alvar habitat and amphibian breeding). Potential impacts and mitigation to these functions are further discussed in **Sections 5.4.1, 5.4.2, and 5.4.3.**

The woodland is considered a disturbed system due to the network of unmaintained roads that currently fragment the habitat. The use of this road network and off-roading by recreational users of the property is currently causing degradation to the vegetation and disturbance and potential mortality to the wildlife inhabiting the woodland.

Direct loss of habitat will be relatively small as the total area of woodland habitat to be removed is approximately 0.8 ha, or 0.9% of the woodland found in the Subject Property. The infrastructure in support of the Project will involve the creation of approximately 1 km of road and underground collector line through woodland. Impacts to the woodland have been minimized by using the existing unmaintained road system where possible and planning roads and underground collector lines to avoid rather than pass through the feature as much as possible. The main road system goes around the majority of the woodland feature, with an approximately 250 m long portion of one road and underground collector line crossing the woodland feature. Roads will be 6 m wide and will include underground collector lines.

The new road and underground collector line will increase the amount of fragmentation by a small increment, but there will be no adverse effects to forest interior or area-sensitive species as the woodland does not currently support these functions.

Clearing activities during construction will result in the removal of vascular plants and portions of plant communities. A botanical survey of the Subject Property found that plant species contained within the Project layout species were common in Ontario. No rare species of vegetation are to be removed as part of the Project. Alteration or removal of vegetation for construction of Project components could have the potential to affect both flora and fauna through loss of species diversity, by reducing or fragmenting available habitat (especially for species with low mobility), from the introduction or spread of invasive species, and from the temporary disruption to movement of wildlife.

The soils and site conditions in the Subject Property create naturally limiting factors for woodland habitat. Given the open, patchy nature of the treed communities in the Subject Property, negative impacts to species diversity and species movement are expected to be minimal. It is not considered to provide interior habitat and it is not anticipated that there will be an increase in parasitism or predation of wildlife.

Impacts such as soil erosion and compaction during construction are expected to be minimal given the shallow soil layer and bedrock present throughout the Subject Property. The woodland is subject to extreme inundation and drying through the year. There are no defined flow paths through the woodland. While there may be localized, very minor changes to ponding immediately adjacent to the new road, no potential effects to woodland vegetation or function are anticipated because the community is well adapted to hydrological extremes.

During operation of the facility, some materials such as lubricating oils and other fluids associated with turbine maintenance have the potential for discharge to the on-site environment through accidental spills resulting in a potential impact to the woodland. Improper disposal of wastes (fluids, containers, cleaning materials) could also have a negative impact on the feature.

5.3.2 Woodlands- Mitigation

The Project layout has minimized disturbance to the woodland and has minimized the length of the road and underground collector line crossing the woodland feature. Access roads are typically responsible for the largest amount of disturbed footprint during construction (Arnett et al., 2007). No anticipated loss of species diversity is associated with the Project.

The following mitigation measures will be implemented:

- As appropriate and prior to construction the limits of vegetation clearing will be staked in the field. The construction contractor will ensure that no construction disturbance occurs beyond the staked limits and that edges of sensitive areas adjacent to the work areas are not disturbed. Regular monitoring of the limits of clearing will be employed to ensure the objective of minimal disturbance. Should monitoring reveal that clearing occurred beyond defined limits notwithstanding the above measures, mitigation action will be taken that could include rehabilitation of the disturbed area.
- All disturbed areas of the construction site should be re-vegetated as soon as conditions allow. Excavated soil from crane pads should be re-used on site as feasible. If not feasible, the soil will be disposed of at an approved off-site facility. Temporary laydown areas should be returned to pre-construction conditions. Once the laydown areas are no longer required, vegetation should be surveyed to assess damage and the potential for natural regeneration. If required, areas should be reseeded with native species.
- Vehicle movements within construction areas and roads will be minimized to avoid the harassment of wildlife. More details regarding mitigation of effects to wildlife are discussed in **Section 5.4**.
- In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately. Refueling is anticipated to take place near the transformer station and parking lot, which is located more than 120m from the woodland. As appropriate, records of waste generation and disposal will be maintained. Where waste disposal monitoring is undertaken it will include a periodic review of all waste records. The purpose of the inspection is to ensure that wastes are properly recycled and/or disposed of, consistent with provincial standards and good industry practices. Where a third party's activities are identified as non-compliant or insufficient, the construction contractor will seek out an alternative recycling or disposal solution.

5.3.3 Net Effects

The woodland in the Subject Property is currently considered disturbed due to the use of this system by off-road vehicles and other recreationalists. Overall, the total clearing required will remove a small proportion of the woodland habitat in the Subject Property (0.9%). Potential

effects to the feature are expected to be minimal as the woodland is currently open, patchy and fragmented with no interior habitat. Indirect effects can be controlled through the use of standard mitigation as discussed above.

5.4 SIGNIFICANT WILDLIFE HABITAT

5.4.1 Seasonal Concentration Areas: Landbird Migratory Stopover

Components of the Project located within significant wildlife habitat (seasonal concentration area for landbird migratory stopover) include:

- Turbine #9, its associated crane pad and temporary laydown area;
- Blade tip area, crane pad and temporary laydown area for turbine #2; and
- Approximately 1 km of road and underground collector line.

Additional components of the Project located within 120 m of significant wildlife (landbird migratory stopover) include:

Project Component	Approximate distance from Significant Wildlife Habitat (Landbird Migratory Stopover) Boundary
Turbine #1, crane pad and temporary laydown area	50 m from blade tip 100 m from turbine base 50 m from temporary laydown area, 60 m from crane pad
Turbine #2 base	10 m from turbine base
Turbine #3	80 m to blade tip 120 m to crane pad and temporary laydown area
Turbine #7, crane pad and temporary laydown area	30 m from blade tip 80 m from turbine base 70 m to crane pad and temporary laydown area
Turbine #5, crane pad and laydown area	50 m to blade tip 100 m to turbine base 100 m to crane pad and temporary laydown area
Road and underground collector line	ranges from 0-120 m

5.4.1.1 Potential Effects

For migratory birds, the Project may have direct effects, specifically mortality arising from collisions with wind turbines or habitat loss, or indirect effects, as in the case of habitat alteration and fragmentation for the Project components, or disturbance of habitat through changes in existing activity levels or land-use.

Potential impacts to migratory landbirds in the Subject Property during construction include disturbance due to increased traffic, noise, or dust. The most adverse impacts associated with construction noise typically occur if critical life cycle activities are disrupted (i.e. nesting, mating) (NWCC, 2002).

No information exists regarding the effects on migrating passerines of disturbance and habitat fragmentation due to wind turbines. A recent radar study examining characteristics of important stopover locations for migrating birds concluded that while migrants used fragments of forested habitat in close proximity to the shores of the Great Lakes for stopovers, the size of forest patches within the landscape was not identified as a significant factor distinguishing concentration areas from non-concentration areas (Bonter et al., 2008).

Because these species in general are able to use a much wider range of habitat types during migration compared to the breeding season, it is expected that the effects of disturbance would be less significant during migration than during the breeding season. Construction is planned to take place during the fall migration, although in a small portion of the identified habitat (0.8ha). The amount of woodland to be removed is approximately 0.9%. This is not expected to impact use of the woodland or available food resources.

During operation, direct mortality is a potential effect. Various studies have been conducted throughout North America to document bird collisions at wind facilities and to determine why collisions may be occurring. From a review of the available literature, it appears that most collisions are of nocturnal migratory songbirds (Kingsley and Whittam, 2007), at least partly because they are the most abundant species at wind energy facilities (National Academy of Sciences, 2007). Most of these studies have shown that direct mortality attributable to wind facilities is low, especially when compared to other anthropogenic structures (Arnett et al., 2007; Kingsley and Whittam, 2007; National Academy of Sciences, 2007), and are not expected to be significant at a population level (Arnett et al., 2007).

The risk of collision is determined by two factors: the number of targets passing through the airspace at the height of turbine blades, and the probability of interaction (Plissner et al., 2008). The probability of interaction is dependent on the exposure rate, which varies from minimal to maximal according to whether the turbines are oriented along the axis of primary flight direction or perpendicular to it, as well as the flight speed of the target, size of target, rotor speed, and blade dimensions (Plissner et al., 2008). Consequently, it should not be assumed that all targets flying between 50 and 150 m are at risk of collision with wind turbines, because if oriented perpendicular to the direction of migration travel, a single wind turbine occupies a maximum of

90 m of the 1 km length perpendicular to travel. Additionally, under many conditions, some birds and bats will detect and alter flight paths to avoid collision (EchoTrack Inc., 2005; Plissner et al., 2008).

There is little to no information available regarding the collision and disturbance effects to owls (Kingsley and Whittam, 2007). No collisions of Northern Saw-whet Owls with wind turbines have been documented in the studies examined by Kingsley and Whittam (2007). The hunting behaviour of Northern Saw-whet Owls from low perches of 3 m or less in forest openings or edges (Rasmussen et al., 2008) is expected to minimize opportunities for colliding with turbine blades. However, behaviour and flight altitude during migration is not well known.

Due to the concentration of raptors during the fall migration period, there is some risk of potential negative effects, including direct mortality and disturbance. Raptors appear to be more vulnerable to collision than other species groups (National Academy of Sciences, 2007). Many of the raptors observed during fall surveys were flying at turbine blade sweep height making them potentially susceptible to collision. In addition, because raptors have relatively low reproductive rates, population recovery from mortality effects can be slow (Kingsley and Whittam, 2007).

Bird mortality at the Erie Shores Wind Project near Port Burwell, Ontario, with a similar shoreline location (but along Lake Erie), was estimated at 2.0 to 2.5 birds per turbine (James, 2008). “Nearshore” turbines, defined as those within 250 m of the lakeshore, were responsible for a disproportionate number of fatalities (James, 2008). Post-construction monitoring included behaviour monitoring of fall migrating raptors and vultures. The behavioural monitoring found several raptor species including Northern Harrier, Sharp-shinned Hawk, Cooper’s Hawk, Red-tailed Hawk and American Kestrel moving through the wind farm in large numbers with no particular avoidance or hesitation in flying past the wind turbines. Results of the mortality searches found a single raptor fatality (Sharp-shinned Hawk) and a single Turkey Vulture fatality during the fall migration season in 2006. Results of more recent studies at the Erie Shores Wind Farm indicated an annual mortality rate of 0.04 raptors per turbine; concurrent behavioural studies concluded the facility does not act as a barrier to migrants (Dance et al., 2009).

Recent estimates of bird mortality at various wind energy facilities in the US ranged from less than 0.5 to 14 birds per MW per year (NWCC, 2010). The closest wind energy facility to the proposed Ostrander Point Wind Energy Park is the Wolfe Island Wind Plant, located in agricultural habitats on Wolfe Island, south of Kingston, Ontario. Recent results indicate an estimated 3.04 birds per MW were struck in the six months ending December 31, 2010 (Stantec, 2010a). It is anticipated that per MW bird mortality would be similar to nearby facilities. As discussed above, authorities believe the level of mortality at wind energy facilities during migration is not significant at the population level (Arnett et al., 2007).

5.4.1.2 Seasonal Concentration Areas- Mitigation

The site plan minimized the Project footprint and incorporated changes to the original proposed layout to provide an increased minimum turbine setback of 200 m, from the original 50 m, to the Lake Ontario shoreline. Three turbines are found at 200 m from the shoreline, with the remaining six ranging from 250 m to greater than 1 km from shoreline. For potential direct effects related to mortality of birds and bats during operation, this is the most important mitigation measure implemented for the Ostrander Point Wind Energy Park. “Nearshore” turbines (defined as those within 250 m of the lakeshore) were shown to be responsible for a disproportionate amount of bird and bat mortality at the Erie Shores Wind Project, which is located at a similar shoreline location in a raptor migration area (but along Lake Erie) (James, 2008). James estimated that bat mortality could be reduced by 50% and bird mortality by 80% at the Erie Shores Wind Project if turbines were not placed in the “nearshore” area.

It is anticipated that per MW bird mortality would be similar to nearby facilities. As discussed above, authorities believe this level of mortality at wind energy facilities during migration is not significant at the population level (Arnett et al., 2007).

Direct loss of habitat will be relatively small as the total area of habitat for migratory landbird stopover to be removed is approximately 0.8 ha, or 0.9% of the woodland found in the Subject Property. The infrastructure in support of the Project will involve the creation of approximately 1 km of access road and underground collector line through woodland. Impacts to the woodland have been minimized by using the existing unmaintained road system where possible and planning access roads and underground collector lines to avoid rather than pass through the feature as much as possible. To minimize habitat related effects, the following mitigation measures should be implemented:

- To the extent practical, tree and/or brush clearing will be completed prior to or after the breeding season for migratory birds (May 1 to July 23). Currently, construction is planned for August-November. However, should clearing be required during the breeding bird season, prior to construction, surveys will be undertaken to identify the presence/absence of nesting birds. If a nest is located, a designated buffer will be marked off within which no construction activity will be allowed while the nest is active.

To confirm the accuracy of predicted effects, post-construction monitoring will be conducted for mortality and disturbance (see Table 5.3, Appendix B). The Environmental Effects Monitoring Plan details the monitoring program methods, identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met. The EEMP is attached as **Appendix L. Rare Vegetation Communities: Alvar**

All components of the Project are located within alvar habitat.

5.4.1.3 Potential Effects

Limited clearing of natural alvar vegetation will be required for the Project. Approximately 5.2 ha of alvar habitat is to be removed (1.7% of that found within the Subject Property). This includes: 0.4 ha of grassland alvar (2%), 4 ha of shrub alvar (2%) 0.3 ha of treed alvar (1.3%); and 0.5 ha (1%) of treed alvar/shrub alvar/swamp complex.

The shrubland alvar community supports species of conservation concern (declining avian shrubland breeding species). The effects and mitigation for this function are assessed in **Section 5.4.4**.

In addition to the direct removal and fragmentation of alvar habitat, areas adjacent to constructed roads and turbine pads have increased potential for the introduction or spread of exotic species.

No rare species of vegetation are to be removed as part of the Project and species diversity is not expected to be reduced. Alvar indicator species are found within two portions of the Project Location; tufted hairgrass and wiry panic grass are found within the open alvar meadow where turbine #5 is sited. False pennyroyal is found within the shrub alvar where turbines #3 and #7 are proposed. Access road and underground collector line passes through these communities. Wiry panic grass, early buttercup, and one community containing both tufted hairgrass and wiry panic grass are found outside of the Project layout.

During site investigations, 27 percent of species at the Subject Property were found to be exotic. Exotic species identified as problematic to alvar communities include common buckthorn, honeysuckles and mossy stonecrop (Goodban, undated). Additional invasive species found onsite include quack grass and Canada bluegrass. Buckthorn was found throughout the Subject Property, with particularly dense concentrations in the ALS1-4 and SWD2-2 communities. Other identified threats to alvar communities include succession, deer browse, trampling and ATV damage (Goodban, undated).

5.4.1.4 Alvar- Mitigation

Efforts have been made to site the Project infrastructure along existing roadways to limit clearing of natural areas, including areas with alvar characteristics. The eastern portion of the Subject Property will remain as a large contiguous area. The alvar habitat remaining is expected to maintain thresholds required for species inhabiting these communities.

The loss of 5.2 ha of alvar habitat should be compensated proportionally. Rehabilitation and compensation opportunities in the Subject Property are limited as much of the Subject Property is currently classified as PSW, significant woodland or significant alvar habitat. There are three patches of cultural meadow that would be candidates for alvar rehabilitation; two in the northeastern corner and one adjacent to the substation and its parking area. These areas total 4.2 ha.

In addition to the direct compensation for habitat loss, a management plan will be created to enhance and preserve the natural heritage qualities of the alvar habitats currently found within the Subject Property by controlling aggressive non-native species found onsite, primarily buckthorn.

The mitigation strategy should include:

- Access roads will be constructed at existing grade.
- As appropriate and prior to construction the limits of vegetation clearing will be staked in the field. The construction contractor will ensure that no construction disturbance occurs beyond the staked limits and that edges of sensitive areas adjacent to the work areas are not disturbed.
- All disturbed areas of the construction site should be re-vegetated as soon as conditions allow. Excavated soil from crane pads should be re-used on site as feasible. If not feasible, the soil will be disposed of at an approved off-site facility. Temporary laydown areas should be returned to pre-construction conditions. Once the laydown areas are no longer required, vegetation should be surveyed to assess damage and the potential for natural regeneration. If required, areas should be reseeded with native species.
- Creation of an alvar management program for the Subject Property involving enhancing the quality of the alvar currently onsite by managing the spread of the invasive Buckthorn and restoration of three parcels of cultural meadow (total of 4.2 ha) to alvar habitat by seeding or transplanting native alvar species.
- Implementation of a monitoring program over the first full growing season following restoration and buckthorn management program to accompany the management program.
- Records of the restoration and Buckthorn control work should be kept and successes or failures communicated and contributed to knowledge of alvar habitats in Ontario.

5.4.2 Specialized Habitats: Amphibian Woodland Breeding Ponds

All components of the project are sited outside significant wildlife habitat: specialized habitats (amphibian woodland breeding ponds).

Components of the Project located within 120 m of significant wildlife (amphibian woodland breeding ponds) include:

Project Component	Approximate distance from Significant Wildlife Habitat (Amphibian Woodland Breeding Ponds) Boundary
Turbine #9, crane pad and temporary laydown area	55 m from blade tip 100 m from turbine base and crane pad 80 m from temporary laydown area,
Access road and underground collector line	100 m at its closest point

5.4.2.1 Potential Effects

All components of the Project are sited outside this feature. No loss of habitat, alteration of groundwater or surface water flow is anticipated from the Project.

Individual reproductive success has been directly related to calling effort in frogs (Sun and Narins, 2004). Therefore, noise is a concern because it can interfere with calling rates, which could in turn impact fitness (Sun and Narins, 2004, Penna et al., 2005). As well, noise may not allow breeding frogs to properly hear and move toward breeding aggregations (Maxell and Hokit, 1999).

Masking of auditory environmental signals, such as mammal warning cries or amphibian calls, may be significant immediately underneath the turbine (Rabin et al., 2006), but the effects rapidly decline with distance from the turbine. A study of low frequency noise and vibration at a modern wind farm determined that vibration is 1/5th to 1/100th of the limit of human perception within 25 m of the turbine base (Legerton et al., 1996). While other mammals and amphibians may be more perceptive of vibration, vibration magnitude drops off significantly as distance increases (K. Smith, Aeroustics, pers. comm.). Turbine #9 is sited approximately 100 m from turbine centre to the provincially significant wetlands that supports significant woodland amphibian populations. This is considered to be a sufficient setback to mitigate any noise and vibration effects to amphibians.

Roads can impact wildlife populations through direct mortality from vehicles, as well as through the increased isolation of populations resulting in decreased genetic diversity (LesBarreres, 2007). Traffic speed is one of the key factors which influences mortality (Farmer and Brooks, 2007), and traffic volume influences both mortality (Fahrig, 2007) and connectivity.

During construction of the turbines, the roads will experience some traffic, which will vary in intensity as the construction phases progress. Some limited mortality is possible, however, the potential long-term effects to wildlife populations from this mortality and from barrier effects is anticipated to be minimal because of the temporary (i.e., one breeding season or less) nature of the increased traffic activity relating to the Project. Amphibians are at increased risk from

vehicle collisions in spring. The construction window for the project is scheduled for August - November 2011, avoiding the most susceptible period for amphibians.

During operation of the Project, access roads will experience infrequent traffic on a daily basis and both mortality and barrier effects are expected to be negligible. The road is located approximately 100 m from the feature. Amphibians are most susceptible in spring, particularly cool spring nights. Maintenance vehicle traffic will primarily be restricted to daytime hours.

Disturbance to local amphibian populations due to increased activity during construction will be temporary. Disturbance during operation of the turbines will also be minimal and temporary due to the periodic nature of maintenance and the fact that local populations will likely adapt to the new structures.

5.4.2.2 Specialized Habitats- Mitigation

The Project components are sited outside the natural feature considered significant amphibian woodland breeding area.

The following mitigation strategy is nonetheless recommended:

- Construction activities to occur outside of amphibian breeding season (April- June)
- Maintenance vehicle traffic will primarily be restricted to daytime hours. Vehicle speeds should be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate 30km/hr limit.
- 100 m setback from turbine centre to the provincially significant wetlands that supports significant woodland amphibian populations.

5.4.2.3 Net Effects

Considering the temporary nature of construction effects, the distance between the feature and the Project components, and the periodic nature of maintenance activities, it is likely that resident herpetiles will adapt to the Project quickly. Consequently, no significant net negative effects are anticipated to amphibian breeding populations and their habitats.

5.4.3 Habitat of Species of Conservation Concern –Declining Shrub/successional Breeding Bird Species

All components of the Project are sited within significant wildlife habitat, habitat for shrub/successional breeding birds.

5.4.3.1 Potential Effects

Indirect effects have the potential to be greater threats than direct mortality. Destruction, fragmentation, and disturbance of habitat as a result of wind energy projects were identified as larger threats to breeding birds than direct mortality (Kingsley and Whittam, 2007). In Minnesota, the density of breeding grassland birds including Bobolink, Red-winged Blackbird, and Savannah Sparrow was reduced by 50% within 80 m of turbines; (Leddy et al., 1999). Studies to date conducted by Stantec did not indicate a reduction of density of breeding grassland birds approaching turbines (Stantec, 2010b). No disturbance information exists for shrubland birds, some of which have been identified as priority species by PIF (2006).

Edge effects may increase predation, parasitism and may affect bird habitat use, reproductive success and site fidelity. Nesting success of shrub-successional species has been observed to be lower at edges (Fink et al., 2006).

The total amount of shrub/successional habitat to be removed from the Subject Property is 4.8 ha (1.7%). The loss of this habitat will result in the loss of nesting territories and a reduction in the amount of food available to birds. Based on the densities in which PIF-designated shrubland species were found within the Subject Property (see **Appendix E**), this would result in loss of habitat for approximately 1 pair of Brown Thrasher, 2 pairs of Field Sparrow and 1 pair of Eastern Towhee. None of the breeding shrubland species observed within the Subject Property are considered area-sensitive and the amount of habitat to be removed is not expected to decrease current populations in the Subject Property below self-sustaining levels. Large contiguous areas of shrubland alvar will remain intact in the eastern portion of the Subject Property. Fragmentation could result in increased rates of nest parasitism and predation.

While Wilson's Snipe and American Woodcock are not specifically identified as shrub/successional species, or as declining species, they are found in the shrub/successional habitat within the Subject Property in relatively high densities and consideration of them is included here. Habitat will be lost for approximately 2 pairs of Wilson's Snipe and 3 pairs of American Woodcock. These species conduct aerial mating displays, and may be at higher risk to collisions with turbines. Most observations of the aerial displays of these species in the Subject Property indicated they attained the height of turbine blade sweep. Disturbance impacts as a result of fragmentation and avoidance are unknown.

Construction activity, such as increased traffic, noise, or dust, has the potential to indirectly disturb birds, particularly breeding birds, and their habitats. Disturbance of birds may occur during all phases of the Project as a result of increased on-site human activities (e.g. site preparation, turbine assembly, maintenance activities). The current level of human activity is low, and is generally restricted to recreational uses.

5.4.3.2 Habitat of Species of Conservation Concern- Mitigation

The Project layout minimized the length of new roads, which typically are responsible for the largest amount of disturbed footprint during construction (Arnett et al., 2007). Efforts were made to use the current road network at the site to the greatest extent possible. A large contiguous portion of shrub/successional habitat remains in the eastern portion of the Subject Property.

Potential disturbance effects to breeding grassland birds can be minimized through avoidance of periods of vulnerability during construction. When the wind plant is operational, mortality and disturbance monitoring studies should be conducted to determine if the turbine operation results in collision with significant bird species or disturbance/avoidance effects.

The following mitigation strategy is recommended:

- To the extent practical, tree and/or brush clearing will be completed prior to or after the breeding season for migratory birds (May 1 to July 23). Currently, construction is planned for August-November. However, should clearing be required during the breeding bird season, prior to construction, surveys will be undertaken to identify the presence/absence of nesting birds or breeding habitat. If a nest is located, a designated buffer will be marked off within which no construction activity will be allowed while the nest is active.
- Turbine lighting must conform to Transport Canada standards. Lights with the shortest allowable flash durations and the longest allowable pause between flashes are preferred.
- Habitat management mitigation measures for shrubland alvar habitat will be implemented as outlined in **Section 5.4.2.2**.
- Post construction monitoring for mortality and disturbance (see **Section 5.5**). The Environmental Effects Monitoring Plan details the monitoring program methods, identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met. The EEMP is attached as **Appendix L**.
- Contribute pre and post construction data to the joint Canadian Wildlife Service – Canadian Wind Energy Association – Bird Studies Canada – Ontario Ministry of Natural Resources Wind Energy Bird and Bat Monitoring Database.

5.5 POST-CONSTRUCTION MONITORING

A post-construction monitoring study for birds and bats has been developed in consultation with the Ministry of Natural Resources that is consistent with guidance provided in MNR's Bat

Guidelines (2010) and other provincial guidance that was available at that time. A summary of the potential negative effects to significant natural features, mitigation strategies, performance objectives, monitoring plan principles (including general methods, location, frequency, rationale and reporting), and contingency measures is outlined in **Table 5.3 (Appendix B)**. This information forms the basis of the monitoring components of the Construction Plan Report and the Environmental Effects Monitoring Plan (EEMP) that has been submitted in the Design and Operations Report as part of the REA application. The Environmental Effects Monitoring Plan also addresses the bird and bat mortality monitoring, which is not a necessary component of this Natural Heritage Assessment (E. Cotnam, MNR, pers. comm., August 16, 2010). The EEMP is included in Appendix L.

Elements of the post-construction monitoring program include:

- Mortality monitoring at all turbines from mid April- end of November, for a period of three years. Searcher efficiency and scavenger trials should be conducted each year according to Environment Canada's protocols (2007b) and available guidance from the MNR.
- A point count-based study to assess disturbance effects to shrubland/successional breeding birds, using the same protocols as the pre-construction surveys. Surveys will be conducted at 7 pre-construction "impact" stations and 7 pre-construction "control" stations (**Table 5.3, Appendix B**).
- A transect-based study to assess disturbance effects to migratory landbirds, using the same protocols as the pre-construction surveys.
- Ongoing hydrological monitoring.
- A point count-based study to assess disturbance effects to amphibians, using the methods of Environment Canada's Road Call Counts modified for off-road use. One new point count will be established in 2011 and will be monitored for two years post-construction.
- Regular reporting that includes analysis and submission of results to MNR.

The monitoring program should be reassessed by MNR, and Gilead at the end of each monitoring year. Pending the reassessment results, the program methodologies, frequencies, and durations may be reasonably modified by the parties to better reflect the findings.

5.6 SUMMARY OF IMPACTS AND MITIGATION

Table 5.2, Appendix B summarizes the potential impacts and suggested mitigation measures to minimize and mitigate the potential negative impacts associated with the planning, design and construction of the proposed Project.


6.0 Conclusions

This Natural Heritage Assessment and Environmental Impact Study for the Ostrander Point Wind Energy Park has been prepared in accordance with O. Reg. 359/09, s. 24-28 and 38.

Once the identified protective, mitigation and compensation measures are applied to the environmental features discussed above, the construction and operation of the Project is not predicted to result in significant residual environmental impacts on the significant features and functions identified through the Natural Heritage Assessment process. An environmental effects monitoring plan that includes a post-construction monitoring program has been developed to confirm the accuracy of predicted effects as well as to monitor the effects to other natural elements.

Stantec Consulting Ltd. prepared this Natural Heritage Assessment and Environmental Impact Study for Gilead Power Corporation for the Ostrander Point Wind Energy Park. Gilead is committed to implementing all the appropriate protection and mitigation measures as they apply to the construction and operation of the Project.

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