AMHERST ISLAND WIND PROJECT
SPECIES AT RISK REPORT

Redacted Version

File No. 160960595
February 2013

Prepared for:

Windlectric Inc. (c/o Algonquin Power Co)
2845 Bristol Circle
Oakville, ON L6H 7H7

Prepared by:
Stantec Consulting Ltd.
Suite 1 – 70 Southgate Drive
Guelph, Ontario N1G 4P5

Disclaimer

Some of the information contained in this document is sensitive in nature and prior to release Algonquin Power (representing Windlectric Inc.) consulted with the Ministry of Natural Resources (“MNR”) to ensure the sensitive species information on habitat was protected (redacted information which may put certain species or habitat at risk). Note: the MNR has the original version. Algonquin Power is committed to providing information to the public while working with the MNR to protect species at risk.

Table of Contents

Table of Contents

Table of Contents

List of Appendices

List of Figures

Appendix A

Figures 2.4 and 2.7 have been redacted from this report.

Table of Contents

List of Tables

Appendix B

1.0 Introduction

The purpose of this report is to provide the Ontario Ministry of Natural Resources (MNR) with the information necessary to verify whether any Species at Risk and their habitat are present within the Project Area, to assess the potential effects of project activities on Species at Risk and their habitat, and to make decisions on approvals and permits under the *Endangered Species Act* (MNR, 2007) (referred to herein as 'ESA 2007').

Guidance in preparing this document was obtained through discussions with MNR staff at various times during its preparation, and more recently through reference to the '*Draft Information Gathering Form for Activities That May Affect Species and/or Habitat Protected Under the Endangered Species Act, 2007*' (MNR, 2012a); and '*Endangered Species Act Submission Standards for Activity Review and 17 (2)(c) Overall Benefit Permits*' (MNR, 2012b).

1.1 SUBMISSION AND CONTACT INFORMATION

This Species at Risk Report has been prepared on behalf of Windlectric Inc. (Windlectric) by Stantec Consulting Ltd. (Stantec) for submission to the Peterborough District MNR.

Project Name:

Amherst Island Wind Energy Project

Proponent Contact Information:

Name:	Sean Fairfield, Senior Manager - Project Planning
Organization:	Algonquin Power Co.
Mailing Address:	2845 Bristol Circle, Oakville, Ontario L6H 7H7
Telephone (work):	905-465-4518
Email:	sean.fairfield@algonquinpower.com

Primary Contacts for Proponent:

Name:	Andrew Taylor and Katherine St. James
Organization:	Stantec Consulting Ltd.
Mailing Address:	Suite 1 – 70 Southgate Drive Guelph, ON N1G 4P5
Telephone (work):	(519) 836-6050
Email:	andrew.taylor@stantec.com and katherine.stjames@stantec.com

Information with respect to the various field surveyors involved in this Project are provided in **Appendix C**.

1.2 PROJECT OVERVIEW

Primary Activity Sector: Renewable Energy (Wind)

Windlectric (a subsidiary of Algonquin Power Co.) is a renewable energy development company based in Oakville, Ontario and is dedicated to providing renewable energy for Ontario. Further information can be found on their website at http://amherstislandwindproject.com/contact-us.html.

Windlectric is proposing to develop the Amherst Island Wind Energy Project (the Project) within Loyalist Township in the County of Lennox and Addington in eastern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province. The Project was awarded an Ontario Feed-In-Tariff (FIT) contract with the Ontario Power Authority (OPA) on February 24, 2011(FIT Contract NO. F-001563-WIN-130-601).

According to subsection 6(3) of O. Reg. 359/09, the Project is classified as a Class 4 Wind Facility.

1.3 PROJECT LOCATION

The Project is proposed within the County of Lennox and Addington in eastern Ontario. The Project Area includes Amherst Island, an approximately 3 - 15 kilometre wide corridor stretching between the Island, and the mainland where the submarine cable is proposed. The mainland portion of the Project Area stretches from the mainland shoreline, north of the Invista Transformer Station and is generally bounded by i) County Road 4 to the West; ii) the Canadian National Railway line to the North; and iii) approximately 500 m East of Jim Snow Drive to the East.

The location of the Amherst Island Wind Project is shown in **Figure 1.0 (Appendix A)**.

The Project is located within MNR's Peterborough District.

1.4 PROJECT COMPONENTS

The Project Location generally consists of the following:

The basic components of the proposed Project include up to 36 Siemens wind turbines. The turbine model proposed utilizes the same 36 turbine pad locations that have been subject to the assessment required under REA. The layout includes 34 Siemens SWT-2.3-113 2300 kW and two (2) Siemens SWT-2.3-113 2221 kW model wind turbines. The final layout will result in a total installed nameplate capacity of approximately 56-75 MW. The number of wind turbines will be dependent upon final selection of the model of the wind turbine most appropriate to the proposed Project. The proposed Project will also include a 34.5 kilovolt (kV) underground and/or overhead electrical power line collector system, fibre optic data lines from each turbine and/or wireless technology for the communication of data, a transmission line, truck turnaround areas,

a submarine cable, an operations and maintenance building, permanent dock, a substation, a switching station, an un-serviced storage shed, one connection point to the existing electrical system, cable vault areas, meteorological tower(s) (met tower(s)), access road(s) to the met tower site(s), and turbine access roads with culvert installations, as required, at associated watercourse crossings.

Temporary components during construction may include staging areas for the turbines, access roads, met tower(s), collector lines and transmission line as well as crane paths, a temporary dock, site office(s), batch plant, central staging areas, and associated watercourse crossings. The electrical power line collector system would transport the electricity generated from each turbine to the substation, along the submarine cable to the mainland and then to a switching station located near to an existing Hydro One Networks Inc. (HONI) 115 kV transmission line.

1.5 ACTIVITY SUMMARY

A general overview of the key activities during construction, operation, and decommissioning phases of the Project is provided in **Table 1.1 (Appendix B)**. The Projected timing and schedule for construction is provided in **Table 1.2 (Appendix B)**. More specific details on the Project phases and related activities are outlined in the following documents:

- Draft Design and Operation Report (Stantec, December, 2012);
- Draft Construction Plan Report (Stantec, December, 2012); and
- Draft Decommissioning Plan Report (Stantec, December, 2012).

These reports are currently drafts that have been released for public review. Final versions of each of these reports will be submitted to the Ministry of the Environment (MOE) as part of the REA Application. Submission of the REA application to MOE is anticipated in late March or early April 2013.

The wind turbines used for the Project can be expected to be in service for the term of the 20-year Ontario Power Authority Feed-In Tariff contract. Following the term of the contract, a decision will be made regarding whether to extend the life of the facility or to decommission. Barring routine scheduled maintenance, the turbines are expected to be operational 24 hours a day, 7 days a week, assuming appropriate wind conditions.

1.6 DURATION OF PROPOSED ACTIVITIES

Targeted start date for construction: Fall 2013

Targeted start date for operation: February 25, 2014 (Commercial Operation Date)

Targeted repowering/decommissioning date: Approximately 20 years after COD

1.7 ASSOCIATED ENVIRONMENTAL REPORTING

The *Amherst Island Wind Project Draft Natural Heritage Assessment and Environmental Impact Study* (NHA/EIS) was prepared by Stantec (final version; November, 2012) and confirmed by MNR (December 14, 2012).

1.8 REPORT OVERVIEW

The information in this report is supplemental to the 'Draft *Amherst Island Wind Energy Project Natural Heritage Assessment and Environmental Impact Study*' required under O. Reg. 359/09. This report should be read in conjunction with the Amherst Island Wind Energy Project NHA/EIS.

The ESA 2007 was created to protect Species at Risk and their habitats in Ontario. Endangered, Threatened and Extirpated species listed on the Species at Risk in Ontario (SARO) list automatically receive legal protection from harm or harassment under the ESA 2007.

In addition to species protection, the ESA 2007 prohibits damage or destruction of habitat for Endangered or Threatened species. This section of the ESA 2007 is subject to transition provisions, meaning that habitat protection does not yet apply to all species. Currently, a given species' habitat may either: not be protected, have general habitat protection or have regulated habitat protection. Whether or not a given habitat is protected and what type of protection it is provided depends mainly on when the species associated with it was added to the SARO list, and on its designated status.

This report includes:

- An assessment of historic presence of Species at Risk within the regional landscape (**Section 2.0**);
- Field survey methods and results used in the determination of the presence of Species at Risk within the Project Area (**Section 3.0**);
- A description and detailed assessment of species presence and habitat for Species at Risk found within the Project Area (**Section 3.0**);
- An assessment of the alternatives considered during the planning stages of the Project to minimize or avoid adverse effects on Species at Risk (**Section 4.0**); and,
- An assessment of the Project impacts on Species at Risk and their habitat found within the Project Location with associated avoidance and mitigation measures (**Sections 7.0, 8.0 and 9.0**).

2.0 Species at Risk Records Review

2.1.1 Background Information

A variety of background documents and sources of information made available through agency staff and on-line resources were reviewed during the preparation of this report. The NHIC database was searched to obtain historic records of provincially Endangered or Threatened species within the vicinity of the Project Area. Provincial wildlife atlases were consulted for amphibians, reptiles, birds and mammals.

Information provided by MNR staff was also used to identify occurrences of Endangered or Threatened species through personal communications with Eric Prevost (Renewable Energy Planning Ecologist) and Kate Pitt (Species at Risk Biologist).

Additional consultation and requests for known Species at Risk occurrences in the Amherst Island Wind Energy Project Study Area were made to:

- Environment Canada. Request for information to Rob Dobos (Manager, Environmental Assessment Section). August 17, 2011;
- Ministry of the Environment. Request for information to Doris Dumais (Director, Environmental Assessment and Approvals). August 17, 2011, May 30, 2012, and December 11, 2012;
- Canadian Environmental Assessment Agency. Request for information to Tracy Allison (Fish Habitat Biologist). August 17, 2011;
- Natural Resources Canada. Request for information to Mathieu Leblanc (Environmental Assessment Officer). August 17, 2011;
- Cataraqui Region Conservation Authority (CRCA). Correspondence with Stephen Knechtal (General Manager). September 16, 2008, August 17, 2011, and October 6, 2011;
- Loyalist Township. Request for information to Murray Beckel (Planner/Chief Building Official of Loyalist Township). September 16, 2008 and October 6, 2011;
- Ministry of Natural Resources. Request for information to Eric Prevost (Renewable Energy Planning Ecologist) and Kate Pitt (Species at Risk Biologist). May 12, 2011, June 3, 2011, February 2012, and ongoing. MNR provided a written response on natural heritage features and Provincially Significant Wetlands (PSW) for the Project Study Area on May 30, 2011 (including Provincially Significant Wetland Evaluations for Wemps Bay Marsh, Nut Island Duck Club Marsh and Long Point Marsh) and during a teleconference on June 3, 2011. Stantec has been in correspondence with the Renewable Energy Planning Ecologist for this region on an on-going basis;

- Kingston Field Naturalists (KFN). Meeting and site walk with Kurt Hennige and Erwin Batalla on May 20, 2011, to visit KFN property and discuss on-island bird communities. Request for bird nesting data sent to Kurt Hennige on June 2, 2011. Bird nesting data received June 24, 2011. Report titled 'Considerations for Amherst Island Natural Heritage Assessment (Draft) dated October 15, 2012;
- Association to Protect Amherst Island. Report titled 'Response to Algonquin Power Co. Report: Construction and Operations Use of Loyalist Township Roads and Right of Way Space on Amherst Island" received December 4, 2012.

Any information received as a result of these consultations was incorporated into this assessment.

The following data sources were also consulted in regard to Species at Risk that could potentially occur in the vicinity of the Project Study Area:

- Natural Heritage Information Centre (NHIC, 2010) database. February 2012. Natural Areas and Species records search. Biodiversity explorer, http:/nhic.mnr.gov.on.ca. OMNR, Peterborough. Accessed February 2012;
- Land Information Ontario (LIO). 2012. LIO digital mapping of natural heritage features;
- Nature Counts (http://www.naturecounts.ca) data. July, 2011;
- Important Bird Areas database (Bird Studies Canada and BirdLife International, undated); and,
- Various wildlife atlases (birds, mammals, herpetofauna).

2.1.2 Results

Fourteen (14) provincially Threatened or Endangered species were identified by background sources and through consultation with MNR, as historically occurring within the general vicinity of the Project Study Area:

- One plant (Butternut);
- Two reptiles (Blanding's Turtle and Eastern Musk Turtle);
- Two mammals (Little Brown Bat and Northern Long-eared Bat);
- Six birds (Least Bittern, Eastern Whip-poor-will, Barn Swallow, Henslow's Sparrow, Bobolink, and Eastern Meadowlark);
- Two fish (American Eel and Spotted Gar); and
- One mussel (Eastern Pondmussel).

The species listed above are summarized in **Table 2.1 (Appendix B)** with a description of their preferred habitat requirements and known occurrences within the regional landscape.

3.0 Species at Risk Surveys

3.1 METHODS

To assess the presence of the species identified through records review as historically occurring within the area and to identify the presence of any additional Species at Risk that occur within the Project Study Area, a site investigation field program was conducted.

Consultation regarding the field methods and protocols used to assess Species at Risk in the Project area has occurred with MNR on an ongoing basis, with Kate Pitt (Species at Risk Biologist) and Eric Prevost (Renewable Energy Planning Ecologist) providing comments on the Species at Risk field program completed in 2011.

Land access was available for all land parcels where components of the wind project are proposed. The Project Study Area was traversed on foot and physically inventoried. The field surveys detailed current conditions within the Project Study Area.

Detailed habitat assessments and mapping, according to the Ecological Land Classification (ELC) system, were completed for the Project to determine whether the critical habitat components required to support each of the species occurred.

All visits conducted during the site investigation program were used to confirm habitat and species occurrences within the Project Study Area. All site investigations were conducted by qualified ecologists. Incidental wildlife observations were recorded during all field investigation visits and the presence of any Endangered or Threatened species was recorded.

Dates, times, duration, field personnel and weather for each terrestrial field survey are presented in **Table 3.1 (Appendix B)**. Duration and effort for each aquatic field survey are presented in **Tables 3.2 and 3.3 (Appendix B).**

A summary of survey protocols and methods used to assess each species are provided in **Table 3.4 (Appendix B).**

Qualifications of field surveyors are provided in **Appendix C**.

Methods for the vegetation community, vascular plants and wildlife surveys conducted to target Species at Risk, are described below.

3.1.1 Terrestrial Habitat Assessments

A botanical inventory and ELC of vegetation communities in the Project Study Area were conducted in 2011 and 2012. Dates, times, duration, field personnel and weather for each field survey are provided in **Table 3.1 (Appendix B)**.

Vegetation communities were delineated on aerial photographs and checked in the field. A botanical inventory was recorded during each site investigation. Plant species were recorded regardless as to whether the plants were identified within a natural feature or a cultural community; this included those species within hedgerows and edges of communities. Community characterizations were then based on the ELC system (Lee et al., 1998). English colloquial names and scientific binominals of plant species generally follow Newmaster et al. (1998).

3.1.1.1 Terrestrial Species Surveys

The field survey program to assess Species at Risk in the Project Study Area included:

- Vascular plant surveys (2011 and 2012);
- Blanding's Turtle and Eastern Musk Turtle habitat assessments (2011);
- Little Brown Bat and Northern Long-eared Bat habitat assessments (2011);
- Eastern Whip-poor-will ground singing surveys (May-June 2011);
- Breeding bird point count and area search surveys (May-July 2011);
- Henslow's Sparrow detailed habitat assessment and nocturnal playback surveys (May-June 2011); and
- Least Bittern habitat assessment and playback surveys (May-July 2011).

The methods for each of these surveys are detailed in the following sections.

Additional surveys for wildlife (not specifically targeting identified Species at Risk occurrences) were also completed within the Project Study Area. These included:

- Spring and fall waterfowl stopover and staging surveys (March-May and October-December 2011);
- Winter raptor driving and walking transect surveys (December 2010-March 2011);
- Spring migratory shorebird surveys (May 2011);
- Spring migratory landbird survey (April-May 2011);
- Fall migratory landbird survey (September-October 2011);
- Fall migratory butterfly surveys (September 2011);
- Fall migratory swallow surveys (July-September 2011);
- Spring waterfowl nesting surveys (May-July 2011);
- Summer woodland raptor nesting surveys (May-July 2011);
- Amphibian surveys (April-June 2011); and

- Breeding bird point count and area search surveys – including open country breeding birds, marsh breeding birds, shrub/early successional breeding birds, and area-sensitive woodland breeding birds, including targeted surveys for Louisiana Waterthrush, Short-eared Owl, and Wilson's Phalarope (May-July 2011).

These survey methods are detailed in the Amherst Island Wind Energy Project NHA/EIS (Stantec, 2012a). Although specific site visits are assigned to target particular Species at Risk, all visits were conducted by qualified ecologists and are used as a means of recording all wildlife observed on site. As such, all observations of Species at Risk made over the duration of the field program are compiled within the list of wildlife for the Project Study Area and are considered in the assessment of wildlife use of the site.

Vascular Plants (Butternut)

Vascular plant surveys were conducted to determine the presence of Butternut in the Project Study Area as well as to identify the presence of any additional vascular plant Species at Risk not identified during the record review.

Vascular plant surveys were conducted in 2011 and 2012, in conjunction with ELC surveys (see **Table 3.1, Appendix B**).

Blanding's Turtle and Eastern Musk Turtle

In conjunction with the ELC and vegetation surveys (as described above), detailed habitat assessments for Blanding's Turtle and Eastern Musk Turtle habitat were conducted in appropriate habitats. Dates, times, duration, field personnel and weather for each field survey and a summary of survey protocols and methods are presented in **Tables 3.1 and 3.4 (Appendix B)**, respectively.

At each open water habitat, a habitat assessment was completed for Blanding's Turtle and Eastern Musk Turtle overwintering habitat. Surveyors recorded microhabitat features in suitable wetland habitats such as estimated water depth, vegetation types, size of wetland, and substrate.

Little Brown Bat and Northern Long-eared Bat

In conjunction with the ELC and vegetation surveys (as described above), detailed habitat assessments for Little Brown Bat and Northern Long-eared Bat habitat were conducted in appropriate habitats. Dates, times, duration, field personnel and weather for each field survey and a summary of survey protocols and methods are presented in **Tables 3.1 and 3.4 (Appendix B)**, respectively.

In each deciduous and mixed woodland, a bat maternity colony habitat assessment was completed for Little Brown Bat and Northern Long-eared Bat. Surveyors recorded microhabitat features observed such number of snags and the species, decay class, description of cavities, and height and type of cavities in each snag. Depending on the species, maternity roosting

colonies for bats can include tree foliage, tree cavities and crevices under loose bark, or buildings.

A search for bat hibernacula features was also conducted in the Renewable Energy Atlas bat hibernacula mapping (LIO 2012) as well as in conjunction with the ELC and vegetation surveys (as described above). Bats require specific environmental conditions for hibernating. These conditions are provided by features such as caves or abandoned mines (MNR 2000). Karst topography and areas of exposed bedrock can be indicators of potentially suitable hibernacula habitat for bats.

Breeding Birds

Breeding bird surveys (point count surveys and area searches) were conducted in the Project Area to assess use by:

- Least Bittern;
- Bobolink;
- Barn Swallow;
- Eastern Meadowlark;
- Henslow's Sparrow;
- Eastern Whip-poor-will; and
- Any additional Endangered or Threatened breeding bird species not identified through the records review.

Three rounds of surveys for breeding birds were conducted at all habitats (woodland, marsh, and grassland), with 14-15 person days per round. The first was conducted from May 30 to June 11, 2011, the second round was conducted from June 15 to June 25, 2011, and the third round was conducted in grassland habitat from June 30 to July 12, 2011. Dates, times, duration, field personnel and weather for each field survey and a summary of survey protocols and methods are presented in **Tables 3.1 and 3.4 (Appendix B)**, respectively. Surveys included point counts and were augmented by area searches through the Project Study Area. Surveys began at, or within, half an hour of sunrise and were completed by 10:00 a.m. Weather conditions (i.e., precipitation and visibility) were within the parameters required by monitoring programs such as Environment Canada's Breeding Bird Survey or the Ontario Forest Bird Monitoring Program, and are provided in **Table 3.1 (Appendix B).**

A total of 63 point count locations were surveyed, and were distributed throughout the Project Study Area to characterize the relative abundance of species breeding within the Project Study Area. A total of 40 point counts were conducted in grasslands, 6 in marsh, and 17 in woodland habitats. The locations of all point counts conducted are shown on **Figures 2.0-2.8, Appendix A**.

Ten minute point counts were conducted at each station. Bird observations were recorded at four distance regimes, within a 50 m radius, 50 to 100 m, outside the 100 m radius, or flyovers. For each point count, a record was made of the start time and a hand held GPS unit was used to georeference its location. A brief description of the habitat was made for each point count. To standardize the data, densities per 10 ha were calculated for each point count.

Area searches were conducted to identify as many breeding bird species as possible that were utilizing the Project Study Area. All areas on or adjacent to lands optioned with the project were traversed on foot during each visit. All species observed were recorded along with which habitat type(s) the species was observed in as well as the level of breeding evidence detected.

Surveys were conducted in compliance with the MNR's guidance document: *Birds and Bird Habitats: Guidelines for Wind Power Projects* (MNR, 2011).

3.1.1.1.1 Eastern Whip-poor-will

Field studies to assess Eastern Whip-poor-will habitat involved conducting singing ground surveys in 2011 to determine Eastern Whip-poor-will presence/absence within the Project Study Area and their approximate distribution.

Three rounds of singing-ground surveys for crepuscular species were conducted between May 18 and June 27, 2011. Dates, times, duration, field personnel and weather for each field survey and a summary of survey protocols and methods are presented in **Tables 3.1 and 3.4 (Appendix B)**, respectively. Surveys were comprised of six minute point counts at ten monitoring stations. Monitoring stations were located throughout the Project Study Area in proximity to suitable woodland features (**Figures 2.0-2.8, Appendix A**). Eastern Whip-poor-will's territorial displays include a loud, repeating call that can be heard upwards of 1 km away. As such, each station was intended to survey suitable habitats within a 1 km radius.

Birds were recorded as either within 100 m or farther than 100 m from the observer. Surveys began approximately 30 minutes after sunset to ensure the peak activity period for calling was captured. Attempts were made to schedule round 1 and 3 of surveys around full moons. Surveys commenced approximately half an hour after sunset and were conducted as close to the full moon as possible and within appropriate weather conditions (i.e. not in high winds or persistent rain).

At each survey station, a record was made of the start time and a hand held GPS unit was used to georeference its location. A brief description of the habitat was made for each point count.

Henslow's Sparrow Nocturnal Playback Surveys

In addition to breeding bird surveys (as described above), two rounds of nocturnal playback surveys targeting Henslow's Sparrow were conducted at 20 locations within the Project Study Area between May 30 and June 22, 2011. Dates, times, duration, field personnel and weather for each field survey and a summary of survey protocols and methods are presented in **Tables**

3.1 and 3.4 (Appendix B), respectively. Survey locations are shown **on Figures 2.0-2.8, Appendix A**.

Survey stations were chosen by expert birders based on suitable habitat requirements for Henslow's. At each survey location, a habitat assessment was completed for Henslow's Sparrow. Surveyors recorded microhabitat features observed within the overall vegetation community such as estimated density of woody vegetation, topography and standing dead residual vegetation.

Henslow's Sparrow sings throughout the day, with higher activity levels before dawn and after dusk. Singing after dusk appears to be particularly active and occasionally individuals may sing all night long (Herkert et al., 2002). Therefore, surveys were conducted after dusk to take advantage of this period of increased activity. The Henslow's Sparrow breeding surveys employed tape playback recording to help detect the sparrows. A Henslow's Sparrow song was broadcast from an MP3 recording, followed by a period of silence to listen for a response. This was repeated several times at each station for a six-minute period.

Least Bittern Playback Surveys

In conjunction with the breeding bird surveys (as described above), three rounds of playback surveys targeting Least Bittern were conducted at the five marsh habitat locations within the Project Study Area between May 30 and July 7, 2011. Dates, times, duration, field personnel and weather for each field survey and a summary of survey protocols and methods are presented in **Tables 3.1 and 3.4 (Appendix B)**, respectively. Survey locations are shown **on Figures 2.0-2.8, Appendix A**.

At each survey location, a habitat assessment was completed for Least Bittern. Surveyors recorded microhabitat features observed within the overall vegetation community such as estimated water depth, vegetation height, vegetation types and percent cover, size of wetland, invasive species presence, and signs of additional threats such as hunting, pollution, or predators.

Least Bittern can be highly secretive, and the Least Bittern breeding surveys employed a playback recording to help with detection. A Least Bittern song was broadcast from an MP3 recording, followed by a period of silence to listen for a response. This was repeated several times at each station for a 15-minute period.

3.1.2 Aquatic Habitat and Species Surveys

The three aquatic Species at Risk identified by the MNR pertain only to the Lake Ontario portion of the Project Study Area (i.e. no fish or mussel Species at Risk were identified as possibly occurring on Amherst Island or the mainland portion of the Project Study Area). Fisheries and Oceans Canada (DFO) was contacted regarding aquatic Species at Risk in the Project Study Area.

Fish community surveys were conducted in the nearshore habitats of the Project Study Area as part of the overall data collection for the project (Water Body Assessment) and did not specifically target the collection of fish Species at Risk. A permit application was submitted to the MNR for a permit under clause 17(2)(b) of the ESA; however, based on the proposed work plan, a permit was not required. Fish collections were conducted in the nearshore habitats on July 4 to July 13 and August 2 to August 4, 2011. Fish were collected using an electrofishing boat (transect method as per DFO's standard electrofishing methods; Brosseau et al., 2005), minnow traps, and fyke nets. Short duration gillnets were deployed in several locations. Fishing effort and locations are provided in **Tables 3.2 and 3.3 (Appendix B)** and **Figures 7.1-7.4** respectively.

A preliminary survey for mussel Species at Risk was conducted on September 12 and 13, 2011 using visual inspection of the lake bottom from the water surface in water depths up to 4.5 m. The survey was conducted from the water surface using glass bottom pail in areas where visibility was reduced due to depth or water clarity. The shoreline areas were surveyed and empty shells were collected and identified to species. Survey locations are provided in **Figures 7.1-7.1**. The survey method was pre-approved by the MNR and the results subsequently provided to Eric Prevost and Kate Pitt of the Peterborough MNR. Survey methods for the fish community surveys are detailed in the Draft Water Assessment and Water Body Report (Stantec, 2012d)

In addition to the fish collections and mussel surveys, Stantec conducted substrate mapping in the littoral zone within the Project Study Area. These data were supplemented by data collected by ASI Group Inc. (a marine survey company), which included side scan sonar of the cable crossing route, substrate sampling and underwater video in the nearshore areas at proposed cable landing locations.

3.2 RESULTS

3.2.1 AMHERST ISLAND PROJECT AREA HABITAT OVERVIEW

Vegetation community mapping for the Project Study Area is provided in **Figures 2.1-2.8 (Appendix A).** Communities are described in **Table 3.5 (Appendix B)**. A detailed description of each natural feature found in the Project Location and 120 m Zone of Investigation can be found in the Amherst Island Wind Energy Project NHA/EIS (Stantec, 2012a).

The Project Location and the associated 120 m Zone of Investigation consisted of a mix of naturalized habitat and active cropland (mainly hay and pasture). Woodland and wetland communities occurred throughout the Zone of Investigation. These communities frequently consisted of deciduous forest and cultural woodland, with fewer occurrences of deciduous swamp. Two large provincially significant coastal marshes occur within the Zone of Investigation: the Nut Island Duck Club Marsh and the Long Point Marsh.

The Project Study Area includes some littoral zone habitats along the shoreline of Lake Ontario for docks and cable landing areas. The submarine cable between Amherst Island and the mainland will be located in water depths of approximately 20 m to 35 m.

All of the 36 turbines are sited within lands currently managed for agriculture (hay or pasture). Grassland habitat includes cultural meadow, hay, and pasture in the Project Study Area, and differs from the open country breeding bird habitat as defined in the NHA. Open country breeding bird habitat has a minimum size requirement of 30 ha, whereas grassland habitat as described in this report does not have a minimum size requirement. The total amount of Eastern Meadowlark habitat to be removed permanently for the duration of Project operation (i.e. long term removal areas) is approximately 17 ha. An additional 77 ha of Eastern Meadowlark habitat removal or disturbance is required temporarily during the construction of the Project. This area includes turbine bases and access road areas for this species. The total amount of Bobolink habitat to be removed permanently is approximately 101 ha. This area includes turbine bases, blade-sweep area, access roads, and a 20 m buffer around access roads due to removal of habitat at edges and vertical structures. An additional 60 ha of Bobolink habitat removal or disturbance is required temporarily during the construction of the Project. Long-term removal areas include infrastructure that will remain in place for the entire Project duration, including turbine bases and access roads. The evaluation of the total amount of vegetation to be impacted during construction includes consideration of the half of the municipal road allowance (on one side of the road) for roadside underground collector lines. Detailed design undertaken in consultation with the Township and/ or County will determine on which side of the road allowance the collector lines will be located.

3.2.2 SPECIES RESULTS OVERVIEW

A list of vascular plant species occurring from the Project Study Area is provided in **Appendix D**. A list of all wildlife species observed during field investigations within the Project Study Area is provided in **Appendix E**.

Species at Risk (provincially Endangered or Threatened) observed in the Project Study Area during the field program included:

- Butternut (observed outside of Project Area);
- Least Bittern (observed outside of Project Area);
- Peregrine Falcon (observed in migration only);
- Eastern Whip-poor-will;
- Barn Swallow;
- Bobolink; and
- Eastern Meadowlark.

Additional details on the occurrences of each these species and an assessment of their habitat within the Project Study Area are provided below.

3.2.3 BUTTERNUT

With the exception of the Butternut, no provincially Threatened or Endangered vascular plant species were identified in the Project Area (see **Appendix D**).

Two Butternuts were identified in the Project Area [redacted]. The closest project components (an access road and associated collector line) are sited more than 200 m from the trees. Neither of the trees will be removed for the Project. Construction activities will occur more than 200 m away at their closest point.

No impact to Butternut trees or their habitat is expected from the Project.

3.2.4 BLANDING'S TURTLE AND EASTERN MUSK TURTLE

3.2.4.1 Habitat Requirements

The Blanding's Turtle (*Emydoidea blandingii)* is provincially ranked S3 (vulnerable) and is designated a provincially and federally threatened species. It is afforded general habitat protection under the *ESA* (2007). Blanding's Turtles frequent lakes, ponds, and marshes, and prefer shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone, nesting may also occur along gravel roadways (COSEWIC, 2005).

The Eastern Musk Turtle (*Sternotherus odoratus*) is provincially ranked S3 (vulnerable) and is listed as Threatened provincially and federally. The Eastern Musk turtle is afforded general habitat protection under the ESA (2007). The Eastern Musk Turtle, also known as Stinkpot, is a small, aquatic freshwater turtle. It is found scattered across south-central Ontario, ranging from the southern edge of the Canadian Shield from Georgian Bay to the Ottawa-Hull region. The Eastern Musk Turtle require aquatic habitats of soft substrate and shallow water with little to no current. Nesting occurs in areas close to the water with direct exposure to sunlight, eggs are laid on the open ground or in shallow excavations in decaying vegetation and rotting wood, nests have also been found in shallow gravel or rock crevices. This species is highly aquatic, and rarely leaves the water (COSEWIC, 2002).

3.2.4.2 Assessment of the Amherst Island Project Study Area

Habitat assessments for Blanding's Turtle and Eastern Musk Turtle were undertaken using data collected through ELC and wetland delineations and evaluations. Most wetlands in proximity to the project location consist of green ash swamps and reed canary grass meadow marsh. These wetlands do not provide the standing water required by turtle species for most of their life processes. Open marsh communities that have the potential to support populations of turtles occur in the large coastal marshes. Of these coastal marshes, the Long Point Marsh is located in proximity to the Project Location with portions of the marsh in proximity to Turbine 36 (78 m from the wetland) and an access road off 3rd Concession Rd (77 m from the wetland).

Blanding's Turtles nest in upland areas of exposed soil, often some distance from the open water. However, all project components within 1 km of Long Point Marsh are situated in hay, pasture or fallow fields with dense ground cover. Site investigations did not identify any potential turtle nesting sites in proximity to the project location, with the potential exception of existing roadsides.

Over the course of all field surveys, no observations of either Blanding's Turtle or Eastern Musk Turtle were made.

3.2.4.3 Conclusion

Although no observations of Blanding's Turtle or Eastern Musk Turtle were made, there is potential for these species to occur in the large coastal marsh in the southwestern portion of the island. The closest project components to these open water communities within the wetland are over 75 m away, which is considered a generous buffer to avoid impacts to these wetland communities. There is potential for Blanding's Turtle to stray from the wetlands into upland habitats in search of nesting sites, however, field studies did not identify any potential turtle nesting sites along the project location. Potential impacts and mitigation measures are discussed in **Section 9.0**. With the implementation of these mitigation measures, no impacts to turtle species are anticipated.

3.2.5 LITTLE BROWN BAT AND NORTHERN LONG-EARED BAT

3.2.5.1 Habitat Requirements

The Little Brown Bat is provincially ranked S5 (Secure) and is designated a federally and provincially Endangered species. This species up until recently was considered the most common bat species in Ontario, and most frequently found bat species in North America. The recent change in status is due to significant declines in recent years attributed to a condition referred to as White-nose Syndrome (WNS). A widespread species, the Little Brown Bat is commonly found near waterbodies in buildings, attics, roof crevices and loose bark on trees or under bridges (Eder, 2002).

This species is listed as vulnerable (S3?) in Ontario and is designated as Endangered federally and provincially by COSEWIC and COSSARO. The Northern Long-eared Bat is a resident bat of upland forests of eastern North America, typically foraging for aerial insects in the forest understorey. Maternity roosts are located under bark or in buildings with young born in June and July while hibernating colonies typically reside in cave crevices (Reid, 2006).

3.2.5.2 Assessment of the Amherst Island Project Study Area

Detailed habitat assessments were conducted during ELC surveys in order to assess the potential for bat maternity colony and hibernacula habitat.

No snags or trees capable of supporting bat maternity roosts were found in numbers greater than 10 per hectare in the Project Study Area, indicating low suitability of habitat for maternity colonies. No known bat hibernacula have been identified within 1 km of the Project Study Area (LIO 2012). The nearest known bat hibernacula are located approximately 26 km to the northeast and 38 km to the northwest of the Project Study Area. No Species at Risk bats were observed during any of the field surveys.

3.2.5.3 Conclusion

No habitat or occurrences of Species at Risk bats occurred in the Project Study Area. No impact to Species at Risk bats or their habitat is expected from the Project.

3.2.6 LEAST BITTERN

3.2.6.1 Habitat Requirements

The Least Bittern is ranked as S4B (apparently secure breeding status rank) provincially and is designated a provincially and federally Threatened species. This species is afforded general habitat protection under the ESA (2007).

The Least Bittern is a relatively small bird that nests in freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs, 1992). The Canadian population of Least Bitterns is estimated at less than 1,000 pairs. The majority of Least Bitterns that breed in Canada are found in Ontario. The species is designated Threatened due to its very small and declining population that depends on high quality marsh habitats that are being lost and degraded across the species' range (COSEWIC, 2009a). The Least Bittern is protected under the Canadian Species at Risk Act (SARA), the Canada/United States Migratory Birds Convention, and the Migratory Bird Treaty between the United States and Mexico.

3.2.6.2 Assessment of the Amherst Island Project Study Area

Marshes of suitable size (i.e. >5 ha for Least Bittern) and structure (open water with dense vegetation) were generally absent from the Project Study Area, with the exception of the Provincially-Significant Long Point Coastal Marsh. This marsh is a 315 ha coastal wetland

complex composed of three separate wetlands and three different wetland communities (CRCA 2006). It is associated with the Long Point Marsh Provincially-Significant Life Science ANSI. This wetland is within 120 m of a proposed turbine access road but does not overlap with the Project Location. The Long Point Marsh provides the best habitat for marsh breeding birds in the region, generally consisting of a large cattail organic shallow marsh dominated by narrow-leaved cattail.

No Least Bittern were recorded in portions of the Long Point Coastal Marsh adjacent to the project location. However, Least Bitterns may have been present deeper into the marsh away from the project location and therefore undetected (**Appendix E**).

One Least Bittern was recorded over 500 m from the Project Area [redacted]

3.2.6.3 Conclusion

One Least Bittern was observed over 500 m from the Project Study Area. No habitat or occurrences of Least Bittern occurred in the Project Study Area. No impact to Least Bittern or its habitat is expected from the Project.

3.2.7 EASTERN WHIP-POOR-WILL

3.2.7.1 Habitat Requirements

In Ontario, the Eastern Whip-poor-will breeds in dry open woodland and is typically associated with forest edges and openings. It prefers rock or sand barrens with scattered trees, savannahs, old burns in a state of early forest succession, and open conifer plantations for breeding (Cadman et al., 2007). The species shows a preference for even-aged stands and it avoids both wide-open spaces and deep forest.

Forests where Eastern Whip-poor-will are found tend to be open with well-spaced trees and a low canopy, or have small to medium sized openings. In fact, the degree of openness in the forest understory appears to be more important than forest composition (Cink, 2002). Along the southern edge of the Canadian Shield the species is most common in mixed pine-oak forests with considerable juniper in the understory (Sandilands, 2010). Pastures, shrubby meadows, pipeline and hydro rights-of-way adjacent to, or in, extensive forests may provide good nesting habitat (COSEWIC, 2009b). Sandilands (2010) identifies key habitat features: shade, proximity to open areas for foraging and fairly sparse ground cover.

Eastern Whip-poor-will is considered an area-sensitive species that requires extensive forest. In Ontario, it is thought to require at least 100 ha, with 500-1,000 ha thought to be necessary to support more than a few pairs (Sandilands, 2010).

The Eastern Whip-poor-will generally arrives in Ontario from mid to end of April (Sandilands, 2010). Peak migration is considered to be third week of May. In Loyalist Township, the late

migration date for Eastern Whip-poor-will is May 31 and the dates between which it is considered safe to regard the species as breeding are from May 15 to August 1 (Ontario Breeding Bird Atlas, 2005).

Known nest dates in Ontario range from May 21 to July 8, with the majority of nesting occurring from June 9 to 30 (Peck and James, 1983). Most Eastern Whip-poor-wills are thought to leave Ontario between early September and early October (Sandilands, 2010).

3.2.7.2 Assessment of the Amherst Island Project Study Area: Habitat

The Eastern Whip-poor-will is a nocturnal species, and is active primarily at twilight and at night during periods of bright moonlight. Individuals often feed in shrubby pastures, wetlands with perches, and power-line and roadway corridors (COSEWIC, 2009b). During the breeding season the Eastern Whip-poor-will regularly sits on gravel roads and sallies to catch insects. Individuals commonly use the same perch to forage from on the edge of open spaces night after night (Cink, 2002). Birds rarely forage further than 500 m from the nest site (Sandilands, 2010).

Nests are typically placed on well-drained, dry soils, usually near the edge of a woodlot or in a forest clearing, and are often on hillsides or hilltops (Sandilands, 2010). Nests are generally placed in areas where the forest understory is sparse, but occasionally are placed among dense shrubbery in open sites, or beside logs (Sandilands, 2010). Most nests are partially shaded by a short herbaceous plant, shrub, or seedling tree (Cink, 2002).

Roosts are considered to be an important component of the nesting habitat for Eastern Whip-poor-will (Sandilands, 2010). During the day, males remain motionless at roost sites. Roost sites are typically located in dense woods with thick leaf litter and a shrubby understory. The Eastern Whip-poor-will typically roosts on a limb close to ground but can roost on tree branches at any height or directly on the ground, including on or beside gravel roads (Cink, 2002). The same roosts are used repeatedly, unless the bird is disturbed (Sandilands, 2010). Eastern Whip-poor-wills also commonly use gravel roads for dust-bathing. Approximately one week after hatching, the young are moved to denser cover (i.e. rearing habitat). The young may move as far as 30 m within their first week of life (Sandilands, 2010).

Day roosting opportunities are provided typically within the denser communities present such as deciduous, coniferous or mixed woodlands. Many small woodlots occur throughout the agricultural fields, with four larger woodland features present of suitable size to support Eastern Whip-poor-will.

- Large areas of deciduous swamp is associated with the Nut Island Duck Club Marsh and the unevaluated wetland, which covers approximately 215 ha. This swamp was generally very wet in nature, holding water for portions of the spring. Although large in size, it is unlikely to provide suitable habitat for Eastern Whip-poor-will due to its wet nature.

- A large wooded area occurs in the northwestern portion of the Project Study Area, measuring approximately 136 ha in size. It is contains both deciduous and coniferous forest cover. Canopy cover is variable, include areas of dense canopy cover, open canopy areas and several woodland openings. In the eastern portion of this feature, the woodland becomes intermixed with hayfields, creating a patchwork of woodland. This woodland was considered to provide suitable habitat for the Eastern Whip-poor-will.
- A very large contiguous swamp located north of South Shore Rd and east of Marshall 40 Foot Rd. This feature is 198 ha and is comprised of a mosaic of vegetation communities. The majority of the feature is not within 120 m of the Project Location. Land use immediately surrounding the woodland feature is primarily actively managed agricultural lands and pasture. This feature is unlikely to provide suitable habitat for Eastern Whip-poor-will due to its wet nature.
- The woodland features found on either side of Marshall 40 Foot Rd on the eastern end of the island (including the “Owl Woods”) is 148 ha in total148 ha in total. It is comprised of deciduous, ash dominated woodland, cultural thicket, coniferous plantation and scattered red cedars. The open dry nature of this woodland makes it suitable habitat for the Eastern Whip-poor-will. This feature, although not contiguous due to Marshall 40 Foot Road, is considered suitable habitat on both sides of the road.

There were 28 additional woodland communities identified in the Project area as part of the NHA process, which were found near Project components. They ranged in size from 0.3 ha to 16 ha, and were mainly composed of deciduous forest and swamp. The mainland portion of the Project Study Area is composed predominately of industrial lands and cultural meadow. Some deciduous and coniferous forest communities occur at the eastern boundary of the Project Study Area.

Figure 3.0-3.8 (Appendix A) depicts habitat for Eastern Whip-poor-will within the Amherst Island Wind Energy Project Study Area for various life processes.

3.2.7.3 Species Occurrences: Ground Survey Station Results

Eastern Whip-poor-will presence and general direction of observations as recorded at each singing ground survey station are shown in **Figures 3.0-3.8, Appendix A**. Eastern Whip-poor-will presence by survey station are provided in **Table 3.6 (Appendix B)**. Overall, Eastern Whip-poor-will observations were concentrated in two distinct portions of Amherst Island; the large woodland features in the northwest and eastern portions of the island.

In the northwestern woodland feature, a single Eastern Whip-poor-will was heard calling during the first round of surveys at Station 2. During the second round two Eastern Whip-poor-wills were heard at Station 3, but none at Station 2. No Eastern Whip-poor-wills were heard within this woodland during the final round of surveys. These results suggest at least two territorial males were present in this woodland feature during the 2011 breeding season. It is noted that no observations were made at Station 5, at the eastern most extent of this woodland, which occurs in a patchwork with agricultural fields.

In the eastern woodland feature, no Eastern Whip-poor-wills were observed during the first round of surveys. However, during the second round, two Eastern Whip-poor-wills were heard a Station 10 and 1 at Station 9. During the third round, a single individual was observed at Station 10. The results of the surveys suggest at least three territorial males were present in this woodland feature during the 2011 breeding season.

No Eastern Whip-poor-will observations were made in other features.

3.2.7.4 Conclusions

Eastern Whip-poor-will and its habitat occurred near the Project Location. No Project components are located in the identified Eastern Whip-poor-will habitats. Impacts, avoidance and mitigation measures for Eastern Whip-poor-will are discussed in **Section 8.0**.

3.2.8 BARN SWALLOW

3.2.8.1 Habitat Requirements

As suggested by its name, the Barn Swallow nests in walls or ledges of barns, as well as on other human-made structures such as bridges, culverts or other buildings (Cadman et al., 2007). Where suitable nesting structures occur, Barn Swallows often form small colonies, sometimes mixed with Cliff Swallows. Barns Swallows feed on aerial insects while foraging in open habitat (Cornell Lab of Ornithology, undated). Foraging habitat would include a variety of habitats in proximity to the nesting structures. Foraging habitat is generally any habitat that is capable of producing flying insects though natural habitats are generally considered to represent better foraging habitats. Barn Swallows are generally considered a grassland species, foraging over meadows, hay, pasture or even mown lawn. They will also frequently forage in woodland clearings, over wetland habitats or open water where insect prey is abundant.

3.2.8.2 Assessment of the Amherst Island Project Study Area

Within the Project Area, suitable nesting sites are likely to include buildings (e.g. barns, sheds etc.), culverts and bridges. Proposed turbine locations are typically set back from suitable nesting structures; typical setbacks from buildings are a minimum of 200 to 300 m, and typical setbacks from roads (i.e. culverts and bridges) are a minimum of 100 m. As such, no potential nesting structures will be impacted. There will be no removal or alteration to structures that could support Barn Swallow nesting. Given the generalized requirements for foraging habitat for Barn Swallows, foraging habitat is not limited within the Amherst Island Project Location and the majority of Amherst Island would constitute potential foraging habitat.

Given the low-flying behaviour of Barn Swallow, they are typically at lower risk of collisions with wind turbines than other swallow species, but fatalities at wind turbines have been recorded. Considering the setbacks to nesting structures, Barn Swallow occurrences in proximity to turbines will likely be minimal during the nesting period; however, occurrences in proximity to turbines in the later summer, after the nesting period, are anticipated.

Barn Swallow was observed in the Project Location during the breeding season. Occurrences were scattered across the Project Study Area, although most observations were made in grassland habitat (**Figures 4.0-4.8**). Occurrences were associated with foraging behaviour.

A total of seven Barn Swallows were observed at point counts in the vicinity of the Amherst Island Wind Energy Project Location:

- One Barn Swallow was observed at breeding bird point count station 10; and
- Six Barn Swallows were observed at breeding bird point count station 59.

Additional Barn Swallow observations occurred during breeding bird area searches. The numbers of Barn Swallows observed were not recorded during these surveys as density could not be calculated from area searches. Barn Swallows were thus observed in habitats:

- Grassland habitats: 1, 4, 9-13, 15-21, 23-27, 29-33, 35-41, and 43;
- Marsh habitats: 1 and 3; and
- Woodland habit: 1, 2, 9, 21, 23-24, 36, 42, 45, and 47.

3.2.8.3 Conclusion

Barn Swallow was observed foraging within the Project Area; however, no breeding habitat was identified in the Project Location. No structures that currently support, or have the potential to support Barn Swallow nesting will be altered or removed for the Project.

3.2.9 HENSLOW'S SPARROW

3.2.9.1 Habitat Requirements

Prior to European settlement in North America, Henslow's Sparrow presumably bred in herbaceous-dominated landscapes such as tallgrass prairie, wet meadow and coastal marsh habitats. With the widespread conversion of forests to agriculture, Henslow's Sparrow adapted to nesting in agricultural grasslands. The species has now been observed in a variety of herbaceous-dominated landscapes including abandoned fields, ungrazed and lightly grazed pasture, fallow hayfields with high clover and alfalfa content, grassy swales in open farmland, wet meadows, infrequently mowed fields and native tallgrass prairie remnants and restorations. Most breeding areas are used for only one year. The extent and condition of agricultural grasslands have been in general decline since at least the 1960s. Occupied areas are typically large, have dense grasses and sedges more than 30 cm tall, a thick mat of dead plant material from the previous year (thatch), a lack of tree and shrub cover, low-lying wet areas and are rarely disturbed by burning, mowing or grazing (COSEWIC, 2011a). Sparse to no woody vegetation is important. They have also been known to have a preference for flatter portions of fields. Henslow's Sparrows are area-sensitive, requiring large tracts of grassland habitat with the minimum size required larger than 30 ha according to COSEWIC (2011a) or 50 ha or more according to Herkert (1991). COSEWIC (2011a) notes that suitable habitat greater than 100 ha are preferred to establish and maintain active colonies.

Henslow's Sparrow, when found, is frequently in loose colonies rather than randomly distributed across available habitat. Nests are built at or near the base of thick grass clumps less than 50 cm above the ground. Clutch size is typically four eggs and egg dates for Ontario range from June 2 to August 14. In the United States the species frequently nests twice in a year and this may also happen in Ontario. The early nesting date is May 19 with most nesting occurring from June 2 to July 15 (Peck and James, 1987).

3.2.9.2 Assessment of the Amherst Island Project Study Area

Vegetation community mapping for the Project Study Area, including the locations where Henslow's Sparrow surveys were conducted, are provided in **Figures 2.0-2.8 (Appendix A)**.

An assessment of the Project Study Area for potential Henslow's Sparrow breeding habitat was completed. The Project Location and surrounding area is comprised of a mix of natural, cultural and agricultural areas. The majority of the Amherst Island Project Study Area is characterized primarily by actively managed agricultural lands (mainly hay and pasture, with some row crops).

Habitat for Henslow's Sparrow was considered low to moderate. Large tracts (i.e. >30 or 50 ha and preferably >100 ha) of open grassland containing the required microhabitat components (i.e. tall dense grasses and sedges, thick ground mats of vegetation, lack of tree/shrub cover) were generally absent from the Project Study Area. Although the pasture and hayfield areas on Amherst Island could provide breeding habitat, this habitat is frequently disturbed and does not provide ideal conditions for Henslow's Sparrow breeding.

Though suitable habitat for Henslow's Sparrow was considered marginal, 20 locations were selected for Henslow's Sparrow surveys in habitat that was considered to contain the best potential for Henslow's Sparrow on Amherst Island. Habitat types of these 20 locations included the following: cultural meadows (CUM1-1), hayfields, pastures, and fallow fields. The vegetation community type found at each survey station is provided in **Table 3.7 (Appendix B)**.

A detailed habitat analysis of these 20 locations in relation to the habitat requirements for Henslow's Sparrow was undertaken to assess their potential to support Henslow's Sparrow. The potential for each of these locations to support Henslow's Sparrow was assessed as low to moderate. The detailed assessment is provided in **Table 3.7 (Appendix B)**.

Henslow's Sparrow is almost extirpated in Canada and Ontario with an estimated national abundance of 0 to 25 individuals depending upon the year. No Henslow's Sparrow were observed in the Amherst Island Project Area as a result of targeted nocturnal playback surveys, during breeding bird surveys or during other field surveys (see **Table 3.7, Appendix B** and **Appendix E**).

3.2.9.3 Conclusion

No occurrences of Henslow's Sparrow occurred in the Project Area. Highly suitable habitat for Henslow's Sparrow was not identified in the Project Area, only limited habitat of low to moderate suitability occurred.

3.2.10 BOBOLINK AND EASTERN MEADOWLARK

Given the overlap between the habitat requirements (i.e. grassland) of Eastern Meadowlark and Bobolink, the two are assessed together.

3.2.10.1 Habitat Requirements

The Bobolink is generally referred to as a 'grassland species'. It nests primarily in forage crops with a relatively high proportion of grasses, predominantly hayfields and pastures. Preferred ground cover species include cool season grasses such as Timothy and Kentucky Bluegrass and forbs such as clover and dandelion (COSEWIC, 2010). Breeding density appears to be significantly higher in habitat with high grass-to-legume ratios (Bollinger and Gavin, 1989; Fritcher et al., 2004; Martin and Gavin, 1995; Patterson and Best, 1996). Use of fields with high proportions of alfalfa is variable (Bollinger and Gavin, 1989; Patterson and Best, 1996; Fritcher et al., 2004).

Bobolink is an area sensitive species, with reported lower reproductive success in small habitat fragments (Kuehl and Clark, 2002; Winter et al., 2004). Bollinger and Gavin (1992) found density of males in fields greater than 30 ha was more than twice that found in fields under 10 ha in size. Various microhabitat features such as crop age (i.e. time since last ploughing and reseeding), vegetation height, litter depth and presence of woody vegetation also influence the suitability of habitat for Bobolink.

Presence of woodland edge can reduce habitat patch size, as Bobolinks avoid woodland edge (Fletcher and Koford, 2003). In addition, the Bobolink is sensitive to habitat fragmentation by woodland edges (Helzer and Jelinski, 1999; Fletcher, 2003). However, they are not sensitive to avoidance or habitat fragmentation by adjacent open habitats (Bollinger and Gavin, 2004).

In suitable habitat, the density of nesting Bobolink can become relatively high. However, males maintain distinct, non-overlapping territories (Martin and Gavin, 1995). Mean territory size has been reported to vary from 0.7 ha in prime habitat to over 2.0 ha in lower quality habitat (Martin, 1971; Wiens, 1969).

Eastern Meadowlarks are ground nesting birds (Harrison, 1975), which are often associated with human-modified habitats where they sing from prominent perches such as roadside wires, trees, and fence posts. As a grassland species, the Eastern Meadowlark typically occurs in meadows, hayfields and pastures. It shows a preference for habitat with abundant grass and litter cover (Lanyon 1995). The Eastern Meadowlark is somewhat tolerant of low shrub or woody vegetation cover (i.e. <5%) (COSEWIC, 2011b).

Eastern Meadowlarks generally prefer large grassland areas over small ones for breeding, with the minimum size required estimated at 5 ha (COSEWIC, 2011b). The size and shape of Eastern Meadowlark territories can change during the course of the breeding season, but territories are commonly 2.8-3.2 ha (COSEWIC, 2011b).

3.2.10.2 Assessment of the Amherst Island Project Study Area: Habitat

The Project Location and surrounding area is comprised of a mix of natural, cultural and agricultural areas. Natural and cultural vegetation communities are described in **Table 3.5 (Appendix B)**.

Bobolink and Eastern Meadowlark both occur in open, herbaceous-dominated vegetation communities. Areas within the Amherst Island Project Study Area assessed as suitable Bobolink and Eastern Meadowlark breeding habitat consisted of the following: cultural meadows (CUM1-1), hayfields, pastures, and fallow vegetation communities. Additional vegetation communities and land uses found within the Project Study Area do not provide suitable habitat for Bobolink or Eastern Meadowlark (i.e. forest communities, shrub communities, thickets, wetlands, plantations or areas used for row crops or rural residences). On Amherst Island, pasture lands where intensive grazing was observed were also considered suitable breeding habitat for Eastern Meadowlark and Bobolink.

Areas of suitable grassland habitat meeting the requirements (i.e. size, structure) to be considered potential Bobolink and Eastern Meadowlark habitat are shown in **Figures 4.0-4.8**.

Fourteen areas of contiguous grassland habitat were identified that extended to within the Project Location footprint. Grassland habitat features are described in **Table 3.8 (Appendix B)**. These 14 grassland habitat features provided approximately 3,188 ha of grassland habitat for Bobolink and Eastern Meadowlark. The majority of grassland consisted of agricultural habitat (pasture and hayfields). Additional areas of known and potential grassland breeding habitat occurred in the regional landscape outside of those habitat features mapped within this assessment for the Amherst Island Wind Energy Project.

Most of these 14 features contain a portion of the wind project footprint (i.e .turbines, access roads, buildings, and/or underground collector lines). Details on project components found within each grassland feature are provided in **Table 3.8 (Appendix B)**. The spatial location of the Project footprint within each habitat feature is shown on **Figures 4.0-4.8** and described in **Table 3.8 (Appendix B)**.

A total of 17 ha of EasternEastern Meadowlark habitat that extended to within the Project footprint will be removed for the duration of the Project's operation. This is 0.55% of the habitat available for this species in the immediate vicinity of the Amherst Island Wind Energy Project Location and a negligible amount of the grassland habitat available in the greater landscape. An additional 77 ha of Eastern Meadowlark habitat will be removed for the construction of the Project components sited on private lands. A total of 101 ha of Bobolink habitat that extended to

within the Project footprint will be removed for the duration of the Project's operation. This is 4.3% of the habitat available for this species in the immediate vicinity of the Amherst Island Wind Energy Project Location and a negligible amount of the Bobolink habitat available in the greater landscape. An additional 60 ha of Bobolink habitat will be removed for the construction of the Project components sited on private lands. TheseThese temporary areas to be removed for construction is considered a temporary loss of habitat as construction activities are short term in duration and following construction, all temporary work locations would be restored to pre-impact conditions.

3.2.10.3 Assessment of the Amherst Island Project Study Area: Species Occurrences

The region of Ontario containing the Project Study Area contains moderate to high relative abundances of Bobolink (Cadman et al., 2007). Generally Grey and Bruce Counties, the Peterborough and Kingston areas as well as the region from the Ottawa and St. Lawrence Rivers are associated with areas of relatively low-intensity agriculture and support the highest Bobolink abundances within Ontario (Cadman et al., 2007). Within areas indicated as high bobolink abundance in the Ontario Breeding Bird Atlas (such as this Project Area), all suitable breeding habitat is considered to provide Bobolink and Eastern Meadowlark habitat.

In grassland habitat in the Amherst Island Project Study Area, the 10 most abundant species were Bobolink (17.99/10ha), Savannah Sparrow (10.67/10ha), Red-winged Blackbird (6.21/10ha), Tree Swallow (3.11/10ha), Song Sparrow (2.79/10ha), European Starling (2.71/10ha), Eastern Kingbird (2.39/10ha), Eastern Meadowlark (2.23/10ha), Yellow Warbler (1.75/10ha) and American Robin (1.19/10ha).

Of the 63 surveyed breeding bird point count locations, Bobolinks were recorded at 41 locations, with Eastern Meadowlark recorded at 17 survey locations. Locations of Bobolink and Eastern Meadowlark occurrences are shown on **Figures 4.0-4.8** and indicated in **Table 3.9 (Appendix B)**.

Bobolink and Eastern Meadowlark were essentially absent from forest and scrub habitat. This finding is consistent with known habitat preferences for these species. No Eastern Meadowlarks occurred in forest or marsh habitat. Four Bobolinks were recorded at a survey location sited within forest habitat (point counts 26 and 30) and one Bobolink was recorded at a survey location sited within marsh habitat (point count 61); however, these features were located adjacent to cultural meadow or hay habitat.

3.2.10.4 Conclusion

Bobolink and Eastern Meadowlark and their habitat are found within the Project Location. Potential impacts and mitigation measures are discussed in **Section 9.0**.

3.2.11 Aquatic Species at Risk

3.2.11.1 American Eel

Habitat Requirements

American Eels use a broad diversity of habitats during their growth period and occur naturally in a range of habitats (MacGregor et al., 2010). Growing eels are primarily benthic, utilizing substrate (rock, sand, and mud), bottom and woody debris, and submerged vegetation for protection and cover (Scott and Crossman, 1973; Tesch, 1977). Vegetation and interstitial spaces of rock piles, logs, and other complex structures are important to American Eel as cover, particularly during daylight hours. Eels typically overwinter in soft substrates where they burrow into the upper layers of sediment (Jessop et al., 2009). Precise information concerning habitat use by eels is lacking (MacGregor et al., 2010).

The Draft Recovery Strategy for American Eel recommends that a habitat regulation for the species should “prescribe that the primary habitat in both lentic and lotic waters be protected, including all waters extending from the high-water mark (including a 30 m riparian buffer) down to a depth of 10 m for all reaches currently or formerly occupied or used as migratory corridors by American Eel.” (MacGregor et al., 2010)

Assessment of the Project Study Area

Fish species and quantities captured in Stantec’s 2011 nearshore fish community surveys are provided along with background data in **Tables 3.10 to 3.14 (Appendix B)**. No American Eels were captured or observed during the survey.

The nearshore area in the vicinity of the proposed Project Island Dock and Cable Landing Area is predominantly cobble overlain by silt or degrading algae, and there are areas of submergent vegetation. At a depth of approximately 2 m, the lake bottom is flat, angular sedimentary rock with approximately 65% coverage by algae. There are three possible dock locations on the mainland and the substrate in most areas is predominantly sand. The East location is predominantly sand, with relatively steep bathymetry. The Central location is sand with areas of cobble, and there is sparse aquatic vegetation. Farther offshore there are large scattered boulders on the sand bottom. The West dock location is in an area of sand (no vegetation), while the alternate cable landing area (west of the West dock) is sand with patchy sparse aquatic vegetation.

Habitat is diverse within the Project Study Area, varying from areas of bedrock, broken rock/rubble on bedrock, sand, etc. Some of the more protected areas support aquatic vegetation. Based on the information presented in MacGregor et al.(2010), habitat within the Project Location is suitable for American Eel.

Conclusion

Although suitable habitat may be available in Lake Ontario within the Project Area, no American Eel individuals were found during Stantec's survey or MNR's 2009 data collection.

3.2.11.2 Spotted Gar

Habitat Requirements

Fish species and quantities captured in Stantec's 2011 nearshore fish community surveys are provided along with background data in **Tables 3.10 to 3.14 (Appendix B)**. No Spotted Gar were captured or observed during the survey.

Spotted Gar generally inhabit warm, shallow (up to 2.6 m depth), clear, calm water such as those found in backwaters areas (Staton et al., 2012). They inhabit areas with dense submergent and emergent vegetation and soft bottom substrates such as sand, silt, clay or muck. Spawning and nursery areas have similar characteristics but are typically associated with shallower water (less than 1 m).

Assessment of the Project Study Area

The locations where in-water work is required for dock and cable construction are not within backwater areas and although some areas are sandy, they support only sparse, patchy growth of aquatic vegetation.

DFO was contacted regarding the status of aquatic Species at Risk in the Project Study Area, as indicated on available mapping resources. Correspondence with DFO confirmed the species identified in the available Species at Risk mapping (DFO/Cataraqui Region Conservation Authority). Although Spotted Gar is mapped in this area, DFO confirmed that at this location there is only one verified sample, not a recognized population (A. Doherty, pers. comm.). Assuming the single specimen from the Bay of Quinte was indicative of a historic population, Spotted Gar populations within the Bay of Quinte are presumed to be extirpated, based on sampling of suitable habitats in the area (COSEWIC, 2005b).

Conclusion

Spotted Gar are considered extirpated from the Project Study Area and suitable habitat is not present in the locations where in-water work is proposed for docks and cable landings. No Spotted Gar were collected or observed during Stantec's survey or during MNR's 2009 data collection program.

3.2.11.3 Eastern Pondmussel

Habitat Requirements

The Eastern Pondmussel is found in protected near-shore areas of lakes and ponds and in slack-water or slow-moving areas of the lower reaches of rivers and in canals. It is found in mud or sand at depths of between 0.3 m and 4.5 m. Specimens are often associated with white (*Nymphaea*) and yellow (*Nuphar*) water lily and can often be found in the transition between emergent wetlands and the open waters of lakes. Juveniles are often completely buried in sediment where they filter water from the interstitial spaces of sandy substrates.

Assessment of the Project Study Area

Stantec's mussel survey observed mussel beds in the areas surveyed; however, no Eastern Pondmussels were found. The species assemblage of shells found on shore was approximately 80% Eastern Elliptio and 20% Fatmucket, both common mussel species.

Substrate in the Project Study Area is very rocky, often bedrock overlaid with patches of rubble and/or cobble. The mainland dock locations were sandier than the island dock location, with patchy aquatic vegetation in some areas. The following is a description by location (see **Figures 7.1-7.4** for dock locations and mussel survey areas):

Mainland Central Dock

- Transect 18 – sand, gravel, cobble and boulder

Mainland West Dock

- Transect 13 – sand
- Transect 14 – boulders and sand

Island Dock

- Transect 008 – sand, gravel and bedrock
- Transect 009 – small cobble and gravel with sand
- Shell Search Location 026 – few clams and few Dreissena (Zebra mussels/Quagga mussels)

Mussel surveys were not conducted in the vicinity of the Mainland East option as it was beyond the limits of the cable landing and dock areas as defined at the time of the survey.

Upon review of Stantec's September 2011 mussel survey, the MNR indicated that as of February 2012, no further mussel surveys were needed in order to confirm the presence/absence of Eastern Pondmussel in the Project Area. The MNR also indicated that there were recent occurrences of the species in the Bay of Quinte. Despite suitable habitat in

some areas of the Project Location, DFO records indicate that Eastern Pondmussel is extirpated from the Amherst Island area (Andrea Doherty, pers. comm.).

Conclusion

Although suitable habitat for Eastern Pondmussel may be available in Lake Ontario within the Project Study Area, no individuals were found, and DFO believes the species to be extirpated from the area.

3.2.12 ADDITIONAL SPECIES IDENTIFIED THROUGH FIELD INVESTIGATIONS

One additional species (Peregrine Falcon), not identified during the records review, was observed during the course of field surveys.

The Peregrine Falcon is currently listed as Special Concern provincially and federally, although at the time of the field surveys, and NHA, was Threatened provincially, and so considered under the ESA. Traditionally, in Ontario, it has been a rare breeder, preferring suitable rock cliffs, particularly those adjacent to water. More recently the species has been released in various urban centres in Ontario where it successfully nests on tall buildings.

One Peregrine Falcon observation was made during the fall stationary migratory raptor surveys: on September 1, 2011, a juvenile male Peregrine Falcon was observed perched in a tree, below blade height, near the shoreline at the southwest corner of Amherst Island. This location is outside the Project Study Area. See **Figure 2.3** for this location. The individual observed was considered a migratory bird. Peregrines can migrate long distances along broad routes following clearly defined landforms, such as shorelines (Ontario Peregrine Falcon Recovery Team, 2010). Peregrine Falcons occasionally stage during migration; however, there do not appear to be any staging areas in Ontario (Ontario Peregrine Falcon Recovery Team, 2010).

Regulated habitat for Peregrine Falcon includes natural cliff faces at least 15 m high and active artificial nest sites (O. Reg. 436/09). No evidence of nesting Peregrine Falcons or presence of suitable nesting habitat on cliff faces or tall buildings occurs within the Project Study Area. No features meeting the definition of regulated Peregrine Falcon habitat are contained within the Project Study Area.

3.2.12.1 Conclusion

Though a transitory Peregrine Falcon was observed in the Project Study Area during migration, the Project Study Area did not support regulated habitat for Peregrine Falcons.

3.3 SUMMARY

Fourteen (14) provincially Threatened or Endangered species were identified by background sources as historically occurring within the general vicinity of the Project Study Area. A summary of the results of the field investigation program (habitat and species presence) is provided in **Table 3.15 (Appendix B)**.

Butternut trees were identified in one location, located more than 200 m from the closest project construction activities. No removal of Butternut trees is proposed within any natural features. No effects are anticipated to the Butternut trees.

No highly suitable habitat was identified in or near the Project Location during site investigations to support the Peregrine Falcon or Henslow's Sparrow (details are provided above and in **Table 3.15, Appendix B**). Though suitable foraging habitat was identified for Barn Swallow, no nesting structures for Barn Swallow were observed in the Project Location.

Species at Risk and habitat that will likely be affected by the proposed activity include:

- Blanding's Turtle and Eastern Musk Turtle;
- Eastern Whip-poor-will;
- Bobolink; and
- Eastern Meadowlark.

Additional details on the extent to which the species and/or habitat will be affected and the measures that will be taken to minimize any adverse effects are provided in **Sections 7.0, 8.0,** and **9.0**.

4.0 Consideration of Reasonable Alternatives

In order to minimize or avoid adverse effects on Species at Risk various alternatives for the Project were considered during the planning stages. An assessment of alternatives is provided in **Table 4.1 (Appendix B)** and described below.

The need for new, renewable electricity generation capacity within the Province of Ontario is documented in the Independent Electricity System Operators (IESO) document entitled: *10-Year Outlook: An Assessment of the Adequacy of Generation and Transmission Facilities to Meet Future Electricity Needs in Ontario, From January 2006 to December 2015* (http://www.theimo.com/imoweb/monthsYears/monthsAhead.asp).

In order for a wind plant to effectively generate electricity, it is critical that the wind turbine generators are located in windy locations. The strong winds that blow across Amherst Island provide excellent potential for wind power generation and make this area particularly suitable for the installation of wind generation facilities.

In response to the Government of Ontario's initiative to promote the development of renewable electricity in the province, Windlectric was granted an Ontario Feed-In-Tariff (FIT) contract with the Ontario Power Authority (OPA) in February 2011 (FIT Contract No. F-001563-WIN-130-601). The contract requires Windlectric to provide a maximum of 75 MW of wind-generated power from the proposed Amherst Island Wind Energy Project (Commercial Operation date February 2014).

In developing the proposed project, various layouts were considered and proposed throughout the design process of the Project. Siting constraints such as noise setbacks, access restrictions, production efficiency, proximity to other turbines, significant wetlands and lot lines restrict placement of the turbine locations. These siting constraints as they restrict the Amherst Island Project Location siting are illustrated in **Figure 5.0 (Appendix A).** The design proposed within this permit application has been planned in a manner that considers each of these setbacks and siting restrictions. As indicated in **Figure 5.0**, once these constraints are considered, placement of the turbine locations is restricted to relatively few locations. Species at Risk habitat, also considered in the placement of turbines, is shown in addition to all other siting constraints in **Figure 6.0**. As evident in **Figure 6.0** the placement of turbines in unconstrained areas while avoiding Species at Risk habitat was limited; however, it was the option selected where possible. Additional constraints (not shown on **Figures 5.0** and **6.0**) such as landowner consultations further restricted placement of turbines. As a result, the final Project layout, as presented within this report, was considered to be the best option to ensure the commitments of the contract requirements were met and ensure renewable energy is provided to the province while minimizing the impact to Blanding's Turtle, Eastern Musk Turtle, Bobolink, Eastern Meadowlark and Eastern Whip-poor-will.

5.0 Project Details

5.1 SUMMARY OF CONSTRUCTION DETAILS

The basic components of the proposed Project include up to 36 Siemens wind turbines. The turbine model proposed utilizes the same 36 turbine pad locations that have been subject to the assessment required under REA. The layout includes 34 Siemens SWT-2.3-113 2300 kW and two (2) Siemens SWT-2.3-113 2221 kW model wind turbines. The final layout will result in a total installed nameplate capacity of approximately 56-75 MW. The number of wind turbines will be dependent upon final selection of the model of the wind turbine most appropriate to the proposed Project.

The Amherst Island Wind Energy Project Draft Construction Plan Report (Stantec 2012b) contains full Project specifications; however, the relevant details to this report are described below:

Specifications of the wind turbines include:

- Tower height: 99.5 m
- Blade length: 55 m
- Rotor diameter: 113 m
- Tip height: 154.5 m

The constructible area at each turbine location is approximately 100 m x 100 m and will be used as a temporary construction staging area. Within the constructible area will be a turbine staging area for construction of the turbine foundation and assembly of the turbine, and a crane pad where the crane(s) will rest during turbine installation.

Gravel access roads will be approximately 4-6 m wide and will not require resizing for the operation phase, with the exception of the entrances off the Township or County roads that require wider turning radii, of approximately 50 m, during operations. A staging area would occur within the approximately 10 m staked constructible area along access roads for construction of the 4-6 m wide access road. Some access roads require turnaround areas for delivery trucks. These turnaround areas will be the same width as access roads, and include the same requirements for staging areas. A staging area would occur within the approximately 50 m wide staked constructible area along access road entrances off municipal roads for construction of the 10 m wide access road entrances. The final area of proposed access roads totals approximately 20.7 ha. Note that the proposed access road to turbines 13, 18, 26, and 30 runs adjacent to Marshall 40 Foot Road on the west side.

A heavy-lift crawler and mobile cranes would be used to assemble the turbines. The movement of the cranes between turbine sites, termed 'crane paths', would follow collector line routes, access roads and municipal roads where possible. The crane(s) would be, in some places, broken down and transported to other turbine locations for re-assembly. However, there may be instances where it is more effective, to minimize potential impact to municipal roads and avoid demobilization of the crane(s), to move the crane(s) along the most direct path possible between two turbines. In the event that cross field crossings are utilized, the crossings will be restricted to follow the underground collector line routes, and have a constructible width of 10 m.

Underground and/or overhead 34.5 kV collector lines (underground on all private land and underground along municipal roads unless specified by the Township) will carry the electricity to the municipal road allowances following the turbine access roads or, along the most direct path possible between two turbines (i.e. across a field). All proposed collector lines have been routed on private lands where landowners have agreements with the Proponent. Where possible, the underground and/or overhead collector lines have been incorporated into the design of the access roads to reduce the area required for construction and minimize the potential construction impacts. Data cabling, if installed, would run with the collector lines.

Associated with the Project will be a substation. At the substation, the accumulated power from the collector lines will be transformed from a 34.5 kV collection voltage to a 115 kV transmission voltage. The substation will consist of a prepared area of approximately 80 m x 100 m in size.

A 115 kV submarine cable will be installed to join transmission lines on Amherst Island and the mainland. The transmission line will connect to the submarine cable via cable vaults.

Associated with the proposed Project will be a switching station where the transmission line on the mainland will be connected to the existing Hydro-One Networks Inc. (HONI) QS6 transmission line. The switching station will consist of a prepared area of approximately 2500 m^2 in size and will be located on private land.

As part of the proposed Project, a permanent docking facility is required on Amherst Island and a temporary docking facility is required on the mainland. The location of the dock on the mainland has not been finalized. There are three alternative locations being considered for the mainland dock.

An operations and maintenance building will be required on the island to facilitate the day-to-day operations of the Project. The building will be located on private land and will be approximately 30 m x 60 m along with parking space and on-site storage. The operations and maintenance would be enclosed in a yard of approximately 1100 m^2 with a chain link fence.

An unserviced storage shed will be situated across Art McGinns Road from S17 and S10, with a building footprint of approximately 6 m x 8 m.

One to three permanent met towers would be installed for use during the operation phase of the Project. The met towers would be a steel lattice structure 60 or 100 m high.

Roadside collector and transmission lines will be sited within the municipal road allowance. Final details of the line requirements will be developed at the detailed design stage in consultation with the Township and County. The entire span of the municipal road allowance has been included within the assessment of temporary land use, though this entire area will not be used for installation of the collector and/or transmission lines.

Temporary central staging areas will be set up on Amherst Island and the mainland to facilitate construction of the proposed Project. The central staging areas vary in size from as small as approximately 30 m x 50 m to as large as approximately 10 hectares. A temporary concrete batch plant will be utilized on Amherst Island to facilitate construction of the proposed Project. The prepared area for the batch plant will be approximately 120 m x 150 m. Temporary site offices will be set up on Amherst Island and the mainland to facilitate construction of the proposed Project. The temporary site offices will not be serviced, and would be placed within the delineated construction work areas. The prepared area for the site office(s) on Amherst Island will be approximately 50 m x 50 m.

6.0 General Mitigation Measures

General mitigation measures for the Project are discussed immediately below, with Species at Risk-specific mitigation measures also provided in subsequent sections. These sections provide recommendations to proactively avoid and minimize harm to Species at Risk. The following mitigation measures should be implemented for the Amherst Island Wind Energy Project to ensure construction, operation and maintenance activities are compliant with the ESA 2007:

The following best management practices and other measures intended to minimize or mitigate potential adverse impacts on adjacent significant natural features will be implemented, where required and reasonable, during the construction and operation of the various turbines, access roads and collector lines.

- 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, mitigation action will be taken that could include rehabilitation of the disturbed area to pre-disturbance conditions at the direction of a qualified ecologist (with enhancement of any disturbed areas).
- To the extent practical, tree and/or brush clearing will be completed prior to or after the core nesting season for migratory birds (May 1 to July 31). 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. The radius of the buffer width will range from 5-60 m depending on the species. Buffer widths are based on the species sensitivity and on buffer width recommendations that have been reviewed and approved by Environment Canada.
- Prior to the start of construction activity, the topsoil/seedbank will be stripped and preserved; material will be reapplied in suitable rehabilitation areas post construction.
- Excavated soil from crane pads will 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 will be returned to pre-construction conditions.
- Following construction, topsoil in areas of temporary disturbance will be replaced/restored. Disturbed areas in agricultural fields will be reseeded with a hay mix. Disturbed areas in non-provincially-significant wetlands 6 and 7 will be reseeded with a native wetland grass mix. Reseeded areas will be monitored for one year to ensure regeneration success.

- Sediment control measures, which may include perimeter silt fencing, mud mats (access roads), check dams (rock or straw bales), and sediment bags (dewatering);
- Silt barriers (e.g., fencing) will be erected along wetland and woodland community edges located within 30 m of construction areas (including staging areas and laydown areas) to minimize potential sediment transport to the significant natural features. These barriers will be regularly monitored and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation; and
- Where culverts are proposed within 30 m of a significant natural feature, enhanced sediment and erosion control measure (i.e. straw bales, double rows of sediment fencing, check dams) will be installed as added protection to filter runoff and further minimize potential sedimentation within the downstream features (wetland, woodland). This added protection is proposed to reduce environmental risk.

The following best management practices and other measures intended to minimize or mitigate potential adverse impacts on aquatic habitat in Lake Ontario will be implemented, where required and reasonable, during the construction and operation of the docks and submarine cable.

- Measures listed in the DFO Operational Statement for Dock Construction;
- Follow MNR in-water construction timing windows - July 1 to March 31 (no work between April 1 and June 30);
- Work from barges where possible;
- Implement a shoreline restoration plan;
- Sediment and erosion control measures;
- Protection of water quality during construction;
- Fish removal plan (for drilling of piles, construction of hydraulic lifts, nearshore cable trenching, etc.);
- DFO Blasting Guidelines, if applicable; and
- Conditions and mitigation measures listed in the DFO's Operational Statement for Underwater Cables. Since the final construction method is not known at the time of report production, additional measures may be required depending on the construction method (trenching vs. directional drilling in the nearshore area).

In addition to the above measures, the following mitigation measures specific to significant wildlife were also included:

- Post-construction mortality monitoring will be conducted twice weekly (3-4 day intervals) mortality monitoring at eleven turbines from May 1 to October 31 including monthly monitoring at all turbines for raptors, and weekly monitoring for raptors during

November, for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents (as detailed in the Environmental Effects Monitoring Plan in the Amherst Island Wind Project Design and Operations Report).

- Post-construction monitoring for disturbance will be conducted for raptor wintering areas, landbird migratory stopover areas, woodland area sensitive breeding bird habitat, open country breeding bird and Short-eared Owl breeding habitat, turtle overwintering habitat, and shrubland/early successional breeding bird habitat.
- Maintenance vehicle traffic on access roads will primarily be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate 30km/hr limit.

Additional area-specific mitigation measures pertaining to construction and operation of the proposed turbines, access roads and other Project components are documented in the NHA/EIS (Stantec, 2012a). These general measures recommended for the protection and minimization of impacts to natural features, general wildlife and wildlife habitat will also assist in avoiding or minimizing potential impacts to Species at Risk.

Overall, three (3) Species at Risk and/or their habitats were identified in or within 120 m of the Project Location and have the potential to be affected by either the construction and/or operation of the proposed Project. Potential effects and avoidance and mitigation measures are discussed in the subsequent sections for Eastern Whip-poor-will, Bobolink, and Eastern Meadowlark. Two additional species, Blanding's Turtle and Eastern Musk Turtle, may occur in proximity to the project location, but beyond the 120 m. Mitigation measure for these species has been included in the subsequent sections as well.

7.0 Blanding's Turtle and Eastern Musk Turtle: Potential Effects and Mitigation Measures

Although no observations of these turtle Species at Risk were made on Amherst Island, potential habitat for Blanding's Turtle and Eastern Musk Turtle exists in the Long Point Marsh, which is shown on **Figure 1.0**.

7.1 POTENTIAL EFFECTS

7.1.1 Construction

Turtles are likely to be at an increased risk of accidental injury or mortality during construction. The active period for turtle is typically from May 1 to October 14. Should vegetation removal or construction activities be required during this period, there is the potential for Species at Risk Turtles to enter the Project Location during daily movements, which may result in potential impacts to the species during construction. Turtles using access roads as basking sites or for movement are also likely to be at an increased risk. Loss of adult Species at Risk turtles, due to accidental mortality, could have a significant negative impact on the local populations. Proposed mitigation measures are discussed below to mitigate any potential effects during construction.

Sensory disturbance to Species at Risk turtles 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). However, sensory disturbances would be most intense during the construction period.

7.1.1.1 Overwintering and Nursery Habitat

No habitat would be removed for the Project.

At the Long Point Marsh, the construction of T36 and the access road to T11 (see **Figure 1.0**) of the Amherst Island Wind Energy Project will be constructed within the range of areas identified as potential habitat.

Given the setbacks of greater than 75 m, impacts to this habitat are unlikely. However, there may be limited potential for impacts during construction and could include: sedimentation, the release of gasoline, oil and other deleterious substances which may drain into the feature, direct mortality to turtles as a result of construction traffic, directly from habitat destruction and degradation and indirectly from reductions in amphibian breeding populations.

With standard construction practices such as use of silt fencing along the perimeter of work areas, storage of equipment, stockpiled soils and other materials within work areas and the fuelling of equipment outside of wetlands, impacts to turtle overwintering and nursery habitat from construction of the access road are expected to be negligible in scale.

7.1.2 Operation

Due to the long distances Species at Risk turtles will travel overland, they are considered particularly susceptible to being struck and killed crossing roadways (COSEWIC, 2005). Although no observations of Species at Risk turtles were made, existing roadways on Amherst Island are expected to pose a potential risk to turtles through traffic mortality and the spread of road salt, dust and oil.

The primary risk to Species at Risk turtles during operation of the facility is related to the installation of the gravel access roads. Potential direct impacts as a result of the installation of access roads include risk of mortality from vehicle collisions or nesting failure.

Access roads are located on private lands and use of these roads will be restricted to use by the wind facility staff for occasional maintenance activities. As a result, the frequency of traffic on new access roads is expected to be very low and traffic speed on access roads is expected to be low. Infrequent use by traffic and slow speeds are expected to reduce the increased risk of mortality to negligible levels. This, combined with the training of staff, signage and the commitment to reporting all observations of Species at Risk turtles (see mitigation measures below), will minimize the potential mortality to turtles.

Indirect impacts to Species at Risk turtles, including avoidance impacts, are not anticipated during the operations phase of the Project.

7.1.3 Decommissioning

Impacts from the decommissioning activities are expected to be similar to that of construction: noise, dust, risk from heavy equipment, and crews being present.

7.2 RECOMMENDED MITIGATION MEASURES

The following mitigation measures are recommended for Species at Risk turtles.

- Avoidance of all overwintering habitat.
- Mitigation measures for vegetation removal, spills, dust and waste to be implemented as outlined in **Section 6.0** of this report.
- Where possible, vegetation clearing, road construction and site preparation for project components located in proximity to the Long Point Marsh should occur between October 15 and April 30, to avoid the most critical life cycle period for Species at Risk turtles.
- If construction activities between May 1 and October 14 are unavoidable, every attempt must be made to avoid harassment or injury to Species at Risk turtles to avoid contravention of the Ontario's *Endangered Species Act* (2007). Immediately prior to vegetation clearing or road construction and/or improvements within 200 m of Species at

Risk turtle habitat, a qualified biologist should carefully search all work areas to identify the presence of Species at Risk turtles.

- Where Species at Risk turtles are observed, all construction or maintenance activity should be halted until the Species at Risk turtles vacates the construction area of its own accord, or if this is not feasible, until a trained professional relocates to the individual to a safe distance within similar habitat that is more than 30 m from activities.
- All persons entering the site should be provided training about Species at Risk turtles and proper steps to take upon encountering a Species at Risk turtles.
- Maintenance vehicle traffic on access roads will primarily be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate 30km/hr limit.
- All observations of Species at Risk turtles on the site should be recorded and submitted to MNR, with any observed fatalities reported to MNR immediately.

7.3 CONCLUSION

Installing the various Project components is anticipated to have limited effect on the Species at Risk turtle habitat as no removal of habitat is proposed.

Species at Risk turtles are considered to be at very low risk from mortality as a result of the installation of access roads given the infrequent use roads will receive (private roads used infrequently for occasional maintenance) combined with the mitigation measures in place as outlined above.

Though the effects of the Project are anticipated to be minimal to Species at Risk turtles, there is some potential for disturbance of natural features and habitats during construction of the Project.

8.0 Bobolink and Eastern Meadowlark: Potential Effects and Mitigation Measures

Bobolink and Eastern Meadowlark habitat and occurrences are shown on **Figures 4.0-4.8**. A summary of habitat removal by grassland habitat feature is provided in **Table 3.8 (Appendix B).**

8.1 POTENTIAL EFFECTS

8.1.1 Construction

Fourteen areas of contiguous grassland habitat were identified that extended to within the Project Location footprint. Grassland habitat features are described in **Table 3.8 (Appendix B)**. These 14 grassland habitat features provide approximately 3,188 ha of grassland habitat for Bobolink and Eastern Meadowlark. The majority of grassland consisted of agricultural habitat (pasture and hayfields).

Eastern Meadowlark habitat to be removed permanently for the duration of Project operation (i.e. long term removal areas) is approximately 17 ha. This area includes turbine bases and access roads for this species. The total amount of Bobolink habitat to be removed permanently is approximately 101 ha. This area includes turbine bases, blade-sweep area, access roads, and a 20 m buffer around access roads for habitat removal. This is less than 1% of the EasternEastern Meadowlark habitat available and less than 5% of the Bobolink habitat available in the immediate vicinity of the Amherst Island Wind Energy Project Location and a negligible amount of the grassland habitat available in the greater landscape, especially given the rotational and quickly established nature of this habitat.

An additional 60 ha and 77 ha, respectively, of known and potential habitat for Bobolink and Eastern Meadowlark may be temporarily affected during construction (constructible area) but would be rehabilitated to its pre-construction condition (agriculture) within one year of the completion of construction activities. **Table 3.8 (Appendix B)** provides the estimated amount of affected habitat per patch (all suitable habitat has been considered Bobolink and Eastern Meadowlark habitat due to species abundance in this area as mapped in Cadman et al., 2007).

Potential Bobolink and Eastern Meadowlark habitat proposed for removal for turbine and access road construction consists primarily of managed agricultural fields (mainly hay and pasture) that are subject to regular agricultural practices such as haying and crop rotation. Current land use and farming practices would be expected to continue by the landowner. The existing farming practice of hay field cutting before the end of the breeding cycle likely reduces breeding success for Bobolink and Eastern Meadowlark within the Project Study Area.

Bobolink, Eastern Meadowlark, and their nests could be at risk of accidental injury or mortality during construction. All clearing of vegetation within grassland habitat will occur between August 15 and May 1 to avoid damage to active nests.

Disturbance from construction activity, such as increased traffic, noise, or dust, may result in avoidance of habitats by birds. These effects are greatest if disturbance occurs during critical life stages such as courtship or nesting (NWCC, 2002).

8.1.2 Operation

Two general types of potential impacts to birds have been identified from wind projects; direct impacts (i.e., mortality from collisions) and indirect impacts (i.e., avoidance or disturbance effects).

Direct Impacts

Grassland species that conduct aerial mating displays may be at higher risk to collisions with turbines. Bobolink is included in this category; however, the results of Stantec studies conducted at several locations in southern Ontario indicate the aerial displays of Bobolink typically occur well below the height of blade sweep (Stantec, 2005; Stantec, 2006; Stantec, 2007). Eastern Meadowlark does not conduct aerial displays and typically flies well below blade sweep height.

In general, resident breeding birds tend to have lower collision rates than non-residents, at least partly because they become familiar with the turbines and avoid them (Kingsley and Whittam, 2007). Post-construction studies conducted at Wolfe Island Wind Plant, located near Kingston, Ontario, have recorded very low mortality rates of Bobolink relative to the local population sizes and no Eastern Meadowlark mortality over the three year program (Stantec, 2010a; Stantec, 2010b).

Environment Canada indicates that the levels of mortality of Bobolink currently observed on Wolfe Island is unlikely to have a significant population effect on Bobolink and that the loss of grassland habitat due to crop rotation would have a far greater impact on the local Bobolink population than mortality caused by collisions with wind turbines (Environment Canada Letter, July, 2012).

Indirect Impacts

Overall, indirect effects have the potential to be greater threats to grassland breeding species than direct mortality. Removal, fragmentation, and disturbance of habitat as a result of wind energy projects were identified as larger threats to breeding grassland birds than direct mortality (Kingsley and Whittam, 2007). The extent of indirect effects varies depending on a number of factors including the sensitivity of the species, type and amount of current disturbance and amount and extent of habitat to be removed.

At the proposed Project Location for the Wind Project, Bobolink and Eastern Meadowlark are currently subject to regular and ongoing disturbance from active farming practices including haying and farm maintenance activities. Haying activities have been identified as the primary threat to Bobolink and Eastern Meadowlark (COSSARO, 2010; COSEWIC, 2011b). Disturbance effects may occur from the ongoing maintenance activities required for operation of the facility, although such activities are localized within the vicinity of the turbine and are infrequent (i.e. twice per year). As well, Bobolink and Eastern Meadowlark occurring within the Project Location are likely accustomed to occasional on-site human activities and currently experience significant disturbance effects (i.e. nest abandonment and predation) and lower reproductive productivity from current cutting practices.

The removal of Bobolink habitat for access roads and turbine footprints has the potential to fragment agricultural habitat and make it less attractive to the area-sensitive Bobolink. However, the establishment of a 6 m (4-6 m wide during construction) wide gravel road through (or along the edge of) a field may not significantly impact populations. For example, Bobolinks are more averse to nesting near woodland edges than adjacent to open fields. In many of these existing fields, existing farm lanes are already present or will be upgraded and used as the access road for the proposed turbines, thereby reducing the potential fragmentation of these fields. Location of the Project within each grassland habitat is shown on **Figures 4.0-4.8** and discussed in **Table 3.8 (Appendix B).**

Fragmentation could also result in increased rates of nest parasitism and predation (Bollinger and Gavin, 1992). As indicated above, Bobolink and Eastern Meadowlark nesting within the proposed Project Location are likely currently subjected to increased rates of predation and lower nesting success rates due to current agricultural practices.

Studies specific to the wind industry indicate that avian productivity of breeding birds does not appear to be negatively affected at many wind facilities (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; grassland habitat located more than 180 m from turbines supported mean densities that were four times higher than habitat closer to turbines (Leddy et al., 1999). Similarly, Wolfe Island has been identified as an important site for breeding grassland species of conservation priority by Ontario PIF (2008) and supports the highest concentrations of Bobolink in southern Ontario (Environment Canada, September 21, 2007). Post-construction monitoring at the Wolfe Island Wind Plant has shown no observed avoidance or disturbance effects to Bobolink to date (Stantec, 2010c).

8.1.3 Decommissioning

Impacts from the decommissioning activities are expected to be similar to that of construction: noise, dust, risk from heavy equipment, and crews being present.

8.2 MITIGATION MEASURES

The following mitigation measures are recommended for the Project:

- Mitigation measures for vegetation removal, spills, dust and waste to be implemented as outlined in **Section 6.0** of this report.
- Vegetation clearing in grassland habitat will occur between August 15 and May 1 (outside of the breeding bird season), to avoid nesting Bobolinks and Eastern Meadowlarks.
- Mitigation measures for vegetation removal, spills, dust and waste to be implemented as outlined in **Section 6.0** of this report. Post construction mortality monitoring will be conducted twice weekly (3-4 day intervals) mortality monitoring at eleven turbines from May 1 to October 31 for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents (as detailed in the Environmental Effects Monitoring Plan in the Amherst Island Wind Project Design and Operations Report).

8.3 CONCLUSION

Installing the various Project components is anticipated to have limited effect on the available grassland habitat within the Project Area (with removal of less than 1% of the habitat identified in the Project Study Area for the duration of the Project) and a negligible amount of available habitat within the regional landscape.

9.0 Conclusion

This Species at Risk Report for the Amherst Island Wind Energy Project has been prepared in consultation with the Ministry of Natural Resources to address potential *Endangered Species Act*, 2007 implications of this Project.

This report has been prepared by Stantec Consulting Ltd. for the Proponent (Windlectric Inc.), and may not be used by any third party without the express written consent of the Proponents. The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of the Report.

STANTEC CONSULTING LTD.

Katherine St. James

Katherine St. James
Intermediate Biologist

Andrew Taylor

Andrew Taylor
Senior Project Manager

w:\active\60960595\reports\sar\redacted version\rpt_60595_sar_20130226_fin_redacted_20130610.docx

10.0 References

Arnett, E. B., D. B. Inkley, D. H. Johnson, R. P. Larkin, S. Manes, A. M. Manville, J. R. Mason, M. L. Morrison, M. D. Strickland, and R. Thresher. 2007. Impacts of wind energy facilities on wildlife and wildlife habitat. Wildlife Society Technical Review 07-2. The Wildlife Society, Bethesda, Maryland, USA

Bollinger, E.K. and T.A. Gavin. 1989. The effects of site quality on breeding-site fidelity in Bobolinks. Auk 106:584-594.

Bollinger, E. K., and T. A. Gavin. 1992. Eastern Bobolink populations: ecology and conservation in an agricultural landscape. Pp. 497–506 *in* Ecology and conservation of neotropical migrant landbirds (J. M. Hagan III and D. W. Johnston, eds.). Smithson. Inst. Press, Washington, D.C.

Bollinger, E. K., and T. A. Gavin. 2004. Responses of nesting Bobolinks (*Dolichonyx oryzivorous*) to habitat edges. *Auk* 121:767-776.

Brousseau, C.M., Randall, R.G., and Clark, M.G. 2005. Protocol for boat electrofishing in nearshore areas of the lower Great Lakes: transect and point survey methods for collecting fish and habitat data, 1988 to 2002. Can. Manuscr. Rep. Fish. Aquat. Sci. 2702: xi + 89 p.

Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner (eds). 1987. Atlas of the Breeding Birds of Ontario. Federation of Ontario Naturalists and Long Point Bird Observatory. Waterloo: University of Waterloo Press.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage and A.R. Couturier (eds). 2007. Atlas of the Breeding Birds of Ontario 2001- 2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto. 706 pp.

Cataraqui Region Conservation Authority. 2006. Central Cataraqui Region Natural Heritage Study: Final Report. Accessed November 2011. Available online: http://www.cataraquiregion.on.ca/management/naturalheritage.htm.

Cink, Calvin L. 2002. Whip-poor-will (*Caprimulgus vociferus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/620doi:10.2173/bna.620

Cornell Lab of Ornithology. Undated. All About Birds: Barn Swallow.[Accessed July 12, 2011]. Available online at: http://www.allaboutbirds.org/guide/Barn_Swallow/id

COSEWIC 2002 (Committee on the Status of Endangered Wildlife in Canada). COSEWIC assessment and status report on the Stinkpot *Sternotherus odoratus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. i + 18 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2003. COSEWIC assessment and status report on the butternut Juglans cinerea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2005a. COSEWIC assessment and update status report on the Blanding's Turtle *Emydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 32 pp.

COSEWIC. 2005b. COSEWIC assessment and update status report on the Spotted Gar, *Lepisosteus oculatus*, in Canada. Committee on the Status of Endangered Wildlife in Canada: Ottawa, Ontario. vi + 17 pp.

COSEWIC. 2009a. COSEWIC assessment and update status report on the Least Bittern *Ixobrychus exilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp.

COSEWIC. 2009b. COSEWIC assessment and status report on the Whip-poor-will *Caprimulgus vociferus*in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp.COSEWIC. 2010. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, Ontario. vi + 42 pp. (http://www.sararegistry.gc.ca*)[Two-month interim status report used in the assessment in June 2010.]*

COSEWIC. 2011a. COSEWIC assessment and status report on the Henslow's Sparrow *Ammodramus henslowii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 37 pp.

COSEWIC. 2011b. COSEWIC assessment and status report on the Eastern Meadowlark *sturnella magna* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, Ontario. vi + 40 pp. (http://www.sararegistry.gc.ca*)*

Eder, T., 2002. Mammals of Ontario. Lone Pine Publishing, Edmonton, Alberta, Canada. pp. 184.

Environment Canada. 2007. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. Prepared by the Canadian Wildlife Service. Final Report, February 2007.

Environment Canada, the Canadian Wind Energy Association and the Ontario Ministry of Natural Resources. 2012. Wind Energy Bird and Bat Monitoring Database Summary of the Findings from Post-construction Monitoring Reports. August 2012. 17pp.

Ferrer, M., de Lucas, M., Janss, G.F.E., Casado, E., Muñoz, A.R., Bechard, M.J., Calabuig, C.P., 2011. Weak relationship between risk assessment studies and recorded mortality in wind farms. J. Appl. Ecol..

Fletcher, R.J. Jr 2003. Spatial and temporal scales of distribution and demography in breeding songbirds: implications of habitat fragmentation and restoration. PhD thesis, Iowa State University.

Fletcher, R.J. and R. Koford. 2003. Spatial responses of Bobolinks (Dolichonyx oryzivorus) near different types of edges in Northern Iowa. Auk 120:799–810.

Fritcher, S. C., M. A. Rumble, and L. D. Flake. 2004. Grassland bird densities in seral stages of mixed-grass prairie. Journal of Range Management 57:351–357.

Gibbs, J. P. 1992. American Bittern (*Botaurus lentiginosus*). *In* The Birds of North America. No. 18). The Academy of Natural Sciences, Philadelphia, Pennsylvania.

Harrison, H. 1975. A field guide to birds' nests (in the United States east of the Mississippi River). Boston, MA: Houghton Mifflin; 1975. 350 p.

Helzer, C. J., and D. E. Jelinski. 1999. The relative importance of patch area and perimeter-area ratio to grassland breeding birds. Ecological Applications 9:1448-1458.

Herkert, J. R. 1991. An ecological study of the breeding birds of grassland habitats within Illinois. Ph.D. dissertation, University of Illinois, Urbana. 115 pp.

Herkert, J. R., P.D. Vickery, and D.E. Kroodsma. 2002. Henslow's Sparrow (*Ammodramus henslowii*). The Birds of North America , No. 672 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia , PA.

Hunt, Pamela D. 2007. Northeast Nightjar Survey: 2007 Summary. New Hampshire Audobon. 19pp.

James, R. D. 2008. The Erie Shores Wind Farm Experience: Nesting Birds. Ontario Birds, August 2008.

Jessop. B.M., J.C. Shiao, and Y. Iizuka. 2009. Life history of American Eels from Western Newfoundland. American Fisheries Society 138:861-871.

Kingsley, A. and B. Whittam. 2007. Wind Turbines and Birds: A Background Review for

Environmental Assessment. Prepared for the Canadian Wildlife Service. Draft April 2, 2007

Kuehl, A.K. and Clark, W.R. 2002. Predator activity related to landscape features in northern Iowa. J. Wildl. Manage. 66:1224–1234.

Lanyon, W.E. 1995. Eastern Meadowlark (Sturnella magna), The Birds of North America Online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, New York.

Leddy, K.L., Higgins, K.F. and Naugle, D.E. 1999. Effects of wind turbines on upland nesting birds in conservation reserve program grasslands. *Wilson Bulletin* 111: 100-104

Lee, H. T., W. D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, South central Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Mabey, Sarah and Paul, Ellen. 2007. Critical Literature Review: Impact of Wind Energy an Human Related Activities on Grassland and Shrub-steppe Birds. Prepared for: The National Wind Coordinating Collaborative. October, 2007.

MacGregor, R., J. Casselman, L. Greig, W. A. Allen, L. McDermott, and T. Haxton. 2010. DRAFT Recovery Strategy for the American Eel (*Anguilla rostrata*) in Ontario. Ontario Recovery Strategy Series. Prepared for Ontario Ministry of Natural Resources, Peterborough, Ontario. vii+ 78 pp.

Martin, S. G. 1971. Polygyny in the Bobolink: habitat quality and the adaptive complex. Ph.D. dissertation. Oregon State University, Oregon. 181 pages.

Martin, S.G., and T.A. Gavin. 1995. Bobolink (*Dolichonyx oryzivorus*). *In* The Birds of North America, No. 176 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

National Wind Coordinating Committee (NWCC). 2002. Permitting of Wind Energy Facilities.

Natural Heritage Information Centre (NHIC). 2010. Provincial status of plants, wildlife and vegetation communities database. http://www.mnr.gov.on.ca/MNR/nhic/nhic.html. OMNR, Peterborough. Accessed November, 2011.

Newmaster, S. G., A. Lehela, M. J. Oldham, P. W. C. Uhlig, and S. McMurray. 1998. Ontario Plant List. Forest Information Paper No. 123, Ontario Forest Research Institute, Sault Ste. Marie, Ontario. 550 pp. + appendices.

Ontario Breeding Bird Atlas. 2005. Online results from 2001-2005 Ontario Breeding Bird Atlas program. http://www.birdsontario.org/atlas/atlasmain.html

Ontario Ministry of Natural Resources (MNR). 2007. Endangered Species Act. Available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm#BK0

Ontario Ministry of Natural Resources (MNR). 2011. Birds and Bird Habitats. Guidelines for Wind Power Projects. 32 pp. December, 2011.

Ontario Ministry of Natural Resources (MNR). 2012a. Draft Information Gathering Form for Activities That May Affect Species and/or Habitat Protected Under the Endangered Species Act, 2007. February 2012.

Ontario Ministry of Natural Resources (MNR). 2012b. Endangered Species Act Submission Standards for Activity Review and 17 (2)(c) Overall Benefit Permits. February 2012.

Ontario Partners in Flight (PIF). 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13), Priorities, Objectives and Recommended Actions. Environment Canada (Ontario Region) and Ontario Ministry of Natural Resources. Final Draft, November, 2008.

Ontario Peregrine Falcon Recovery Team. 2010. Recovery strategy for the Peregrine Falcon (*Falco peregrinus*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 36 pp.

Patterson, M. P., and L. B. Best. 1996. Bird abundance and nesting success in Iowa CRP fields: the importance of vegetation structure and composition. American Midland Naturalist 135:153-167.

Peck, G, K. and James R.D. 1983. Breeding Birds of Ontartio Nideology and Distribution. Royal Ontario Museum. Vol. I

Peck, G, K. and James R.D. 1987. Breeding Birds of Ontartio Nideology and Distribution. Royal Ontario Museum. Vol. II

Reid, F. 2006. The Peterson Field Guide Series: A field guide to mammals of North America, 4th ed. Houghton Mifflin Company, New York, New York. 579 p.

Sandilands, A. P. 2010. Birds of Ontario: habitat requirements, limiting factors and status. Vol. II, Nonpasserines: Shorebirds through Woodpeckers. UBC Press.

Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. Bulletin 184, Fisheries Research Board of Canada, Ottawa, Canada.

Stantec Consulting Ltd. 2005. Spring Migration and Breeding Bird Report, Melancthon Grey Wind Project. February, 2005. Prepared for: Canadian Hydro Developers Inc.

Stantec Consulting Ltd. 2006. Kingsbridge II Wind Power Project: Bird Report. November, 2006. Prepared for: EPCOR Power Development Corp.

Stantec Consulting Ltd. 2007. Bird Report, Wolfe Island Wind Project. November, 2007. Prepared for: Canadian Hydro Developers Inc.

Stantec Consulting Ltd. 2010a. Melancthon EcoPower® Centre Post-Construction Bird and Bat Monitoring Report: 2009. Prepared for TransAlta Corporation. February 2010.

Stantec Consulting Ltd. 2010b. Wolfe Island EcoPower Centre: Post-construction Follow-up Plan Bird and Bat Resources – Monitoring Report No. 3, January-June 2010.

Stantec Consulting Ltd. 2011. Ostrander Point Wind Energy Park Natural Heritage Assessment and Environmental Impact Study. Prepared for Gilead Power Corporation. May, 2011.

Stantec Consulting Ltd. 2012a. Amherst Island Wind Energy Project Natural Heritage Assessment and Environmental Impact Study. Prepared for Windlectric Inc.. November, 2012.

Stantec Consulting Ltd. 2012b. Amherst Island Wind Energy Project Draft Construction Plan Report. Prepared for Windlectric Inc.. November, 2012.

Stantec Consulting Ltd. 2012c. Wolfe Island Wind Plant, Post-construction Follow-up Plan: Bird and Bat Resources, Monitoring Reports 1-6.

Stantec Consulting Ltd. 2012d. Amherst Island Wind Farm Project Water Assessment and Water Body Report. Prepared for Windlectric Inc. December, 2012.

Staton, S.K., A.L. Boyko, S.E. Dunn, and M. Burridge. 2012. Recovery strategy for the Spotted Gar (*Lepisosteus oculatus*) in Canada (Proposed). *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. vii + 57 p.

Tesch, F.W. 1977. The eel: biology and management of anguillid eels. Chapman Hall, London.

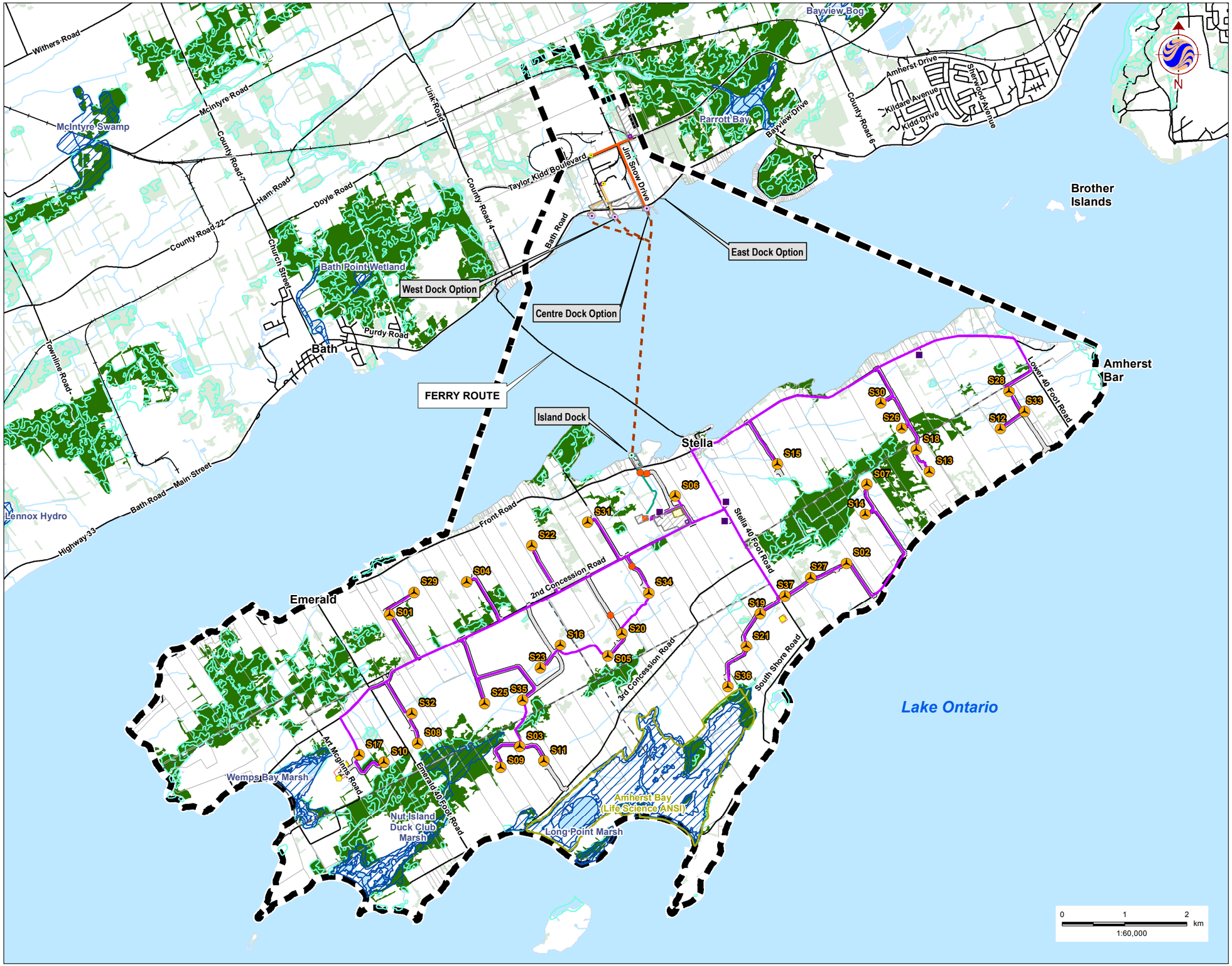
U.S. Fish and Wildlife Service (USFWS). 2012. U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines. March, 2012. 71 pp.

Wiens J.A. 1969. An approach to the study of ecological relationships among grassland birds. Ornithol Monogr 8:1–93

Winter, M., D.H. Johnson, J.A. Shaffer, and W.D. Svedarsky. 2004. Nesting biology of three grassland passerines in the northern tallgrass prairie. Wilson Bull. 116:211-223.

Appendix A

Figures



Legend

- Project Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Provincially Significant Wetland
- Wetland
- Woodlot
- Significant Woodlot
- ANSI Boundary
- Property Boundary

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

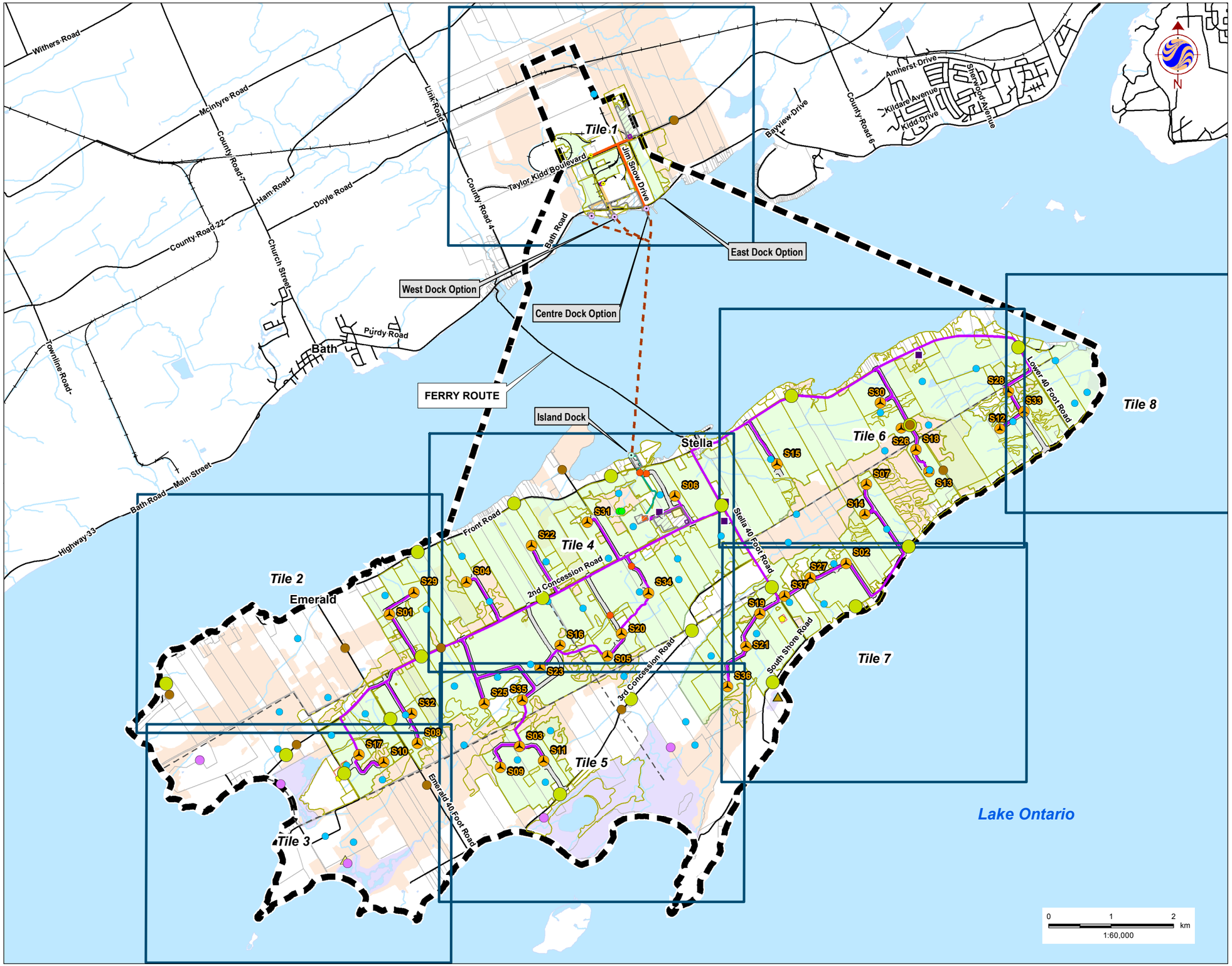
Figure No.

1.0

Title

Project Location & Study Area

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig1_ProjectLocation_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Project Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Property Boundary
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

2.0

Title

Vegetation Communities & Species Survey Stations - Overview

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_Overview_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

2.1

Title

Vegetation Communities & Species Survey Stations

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

2.2

Title

Vegetation Communities & Species Survey Stations

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_20130102.mxd
Revised: 2013-01-02 By: pworsell

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

2.3

Title

Vegetation Communities & Species Survey Stations

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

2.5

Title

Vegetation Communities & Species Survey Stations

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

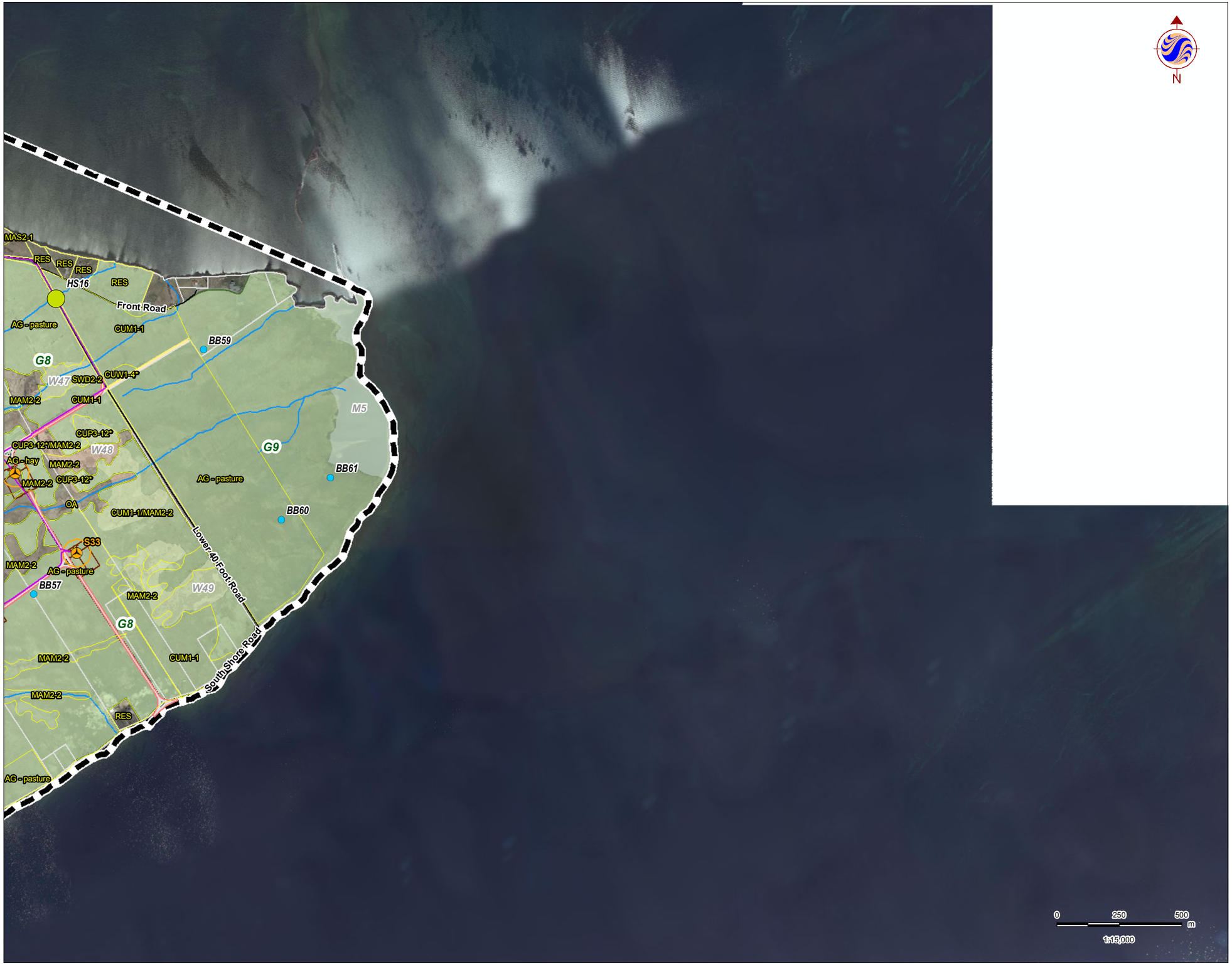
Figure No.

2.6

Title

Vegetation Communities & Species Survey Stations

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- ELC Boundary

Species Observed

- Butternut (BU)
- Least Bittern (approximate) - (LBO)
- Peregrine Falcon (PF)

Species Survey Stations

- Breeding Bird Point Count (BB)
- Eastern Whip-poor-will Survey Station (EW)
- Henslow's Sparrow Survey Station (HS)
- Least Bittern Survey Station (LB)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Marsh
- Woodland

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

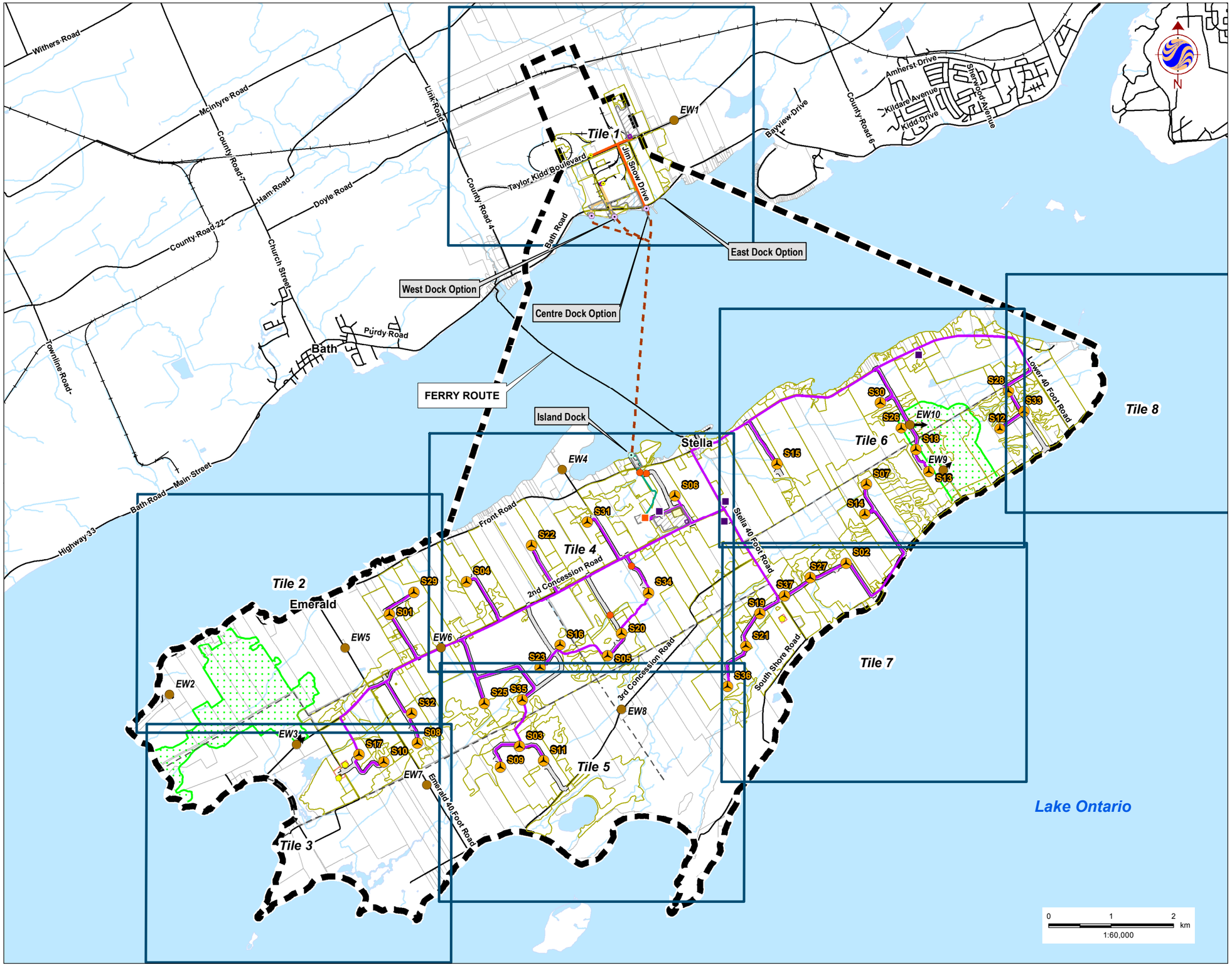
Figure No.

2.8

Title

Vegetation Communities & Species Survey Stations

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig2_VegetationCom_SpeciesSurveys_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Project Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Property Boundary
- ELC Boundary

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

3.0

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping - Overview

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_Overview_20130128.mxd
Revised: 2013-01-28 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

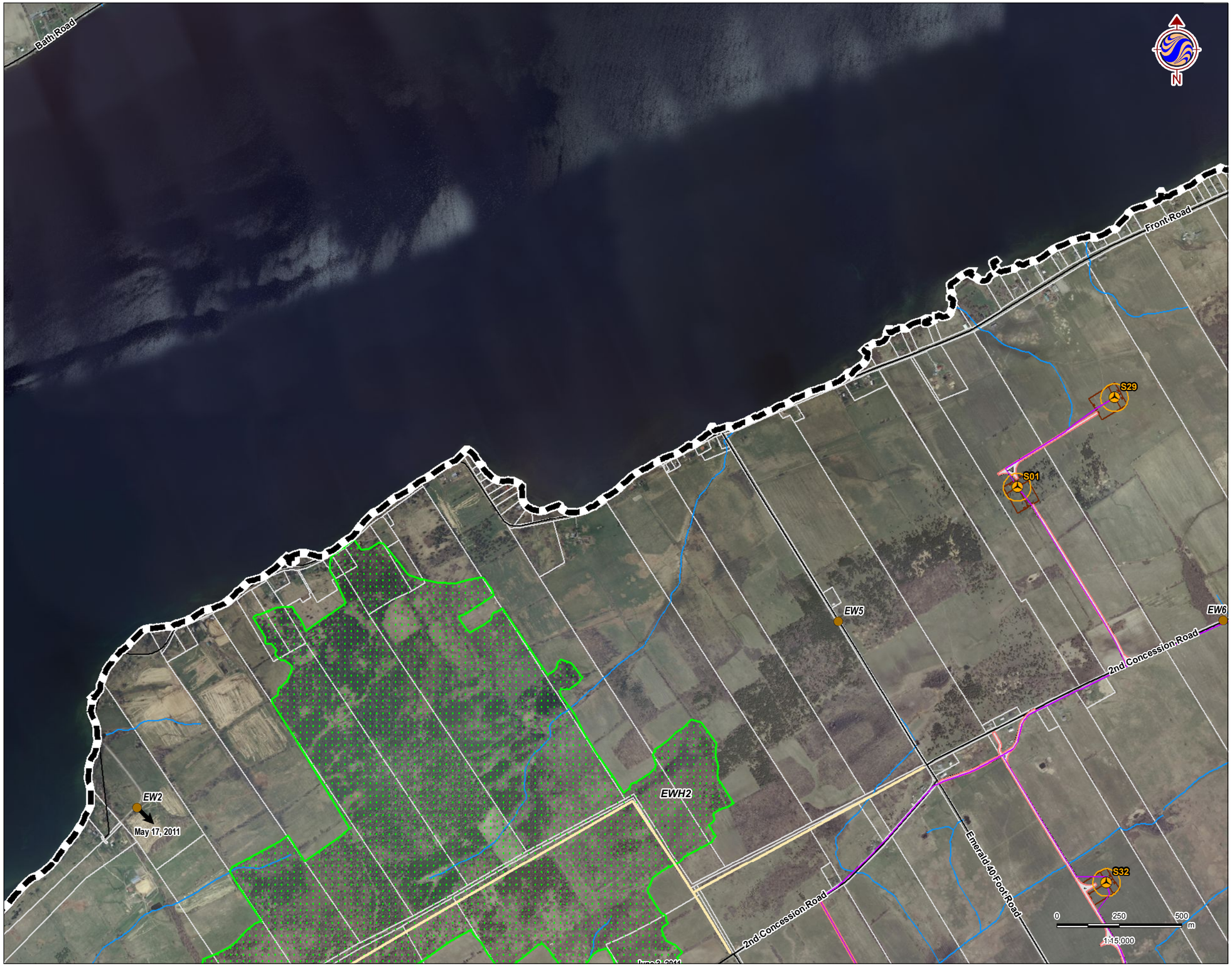
Figure No.

3.1

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

3.2

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

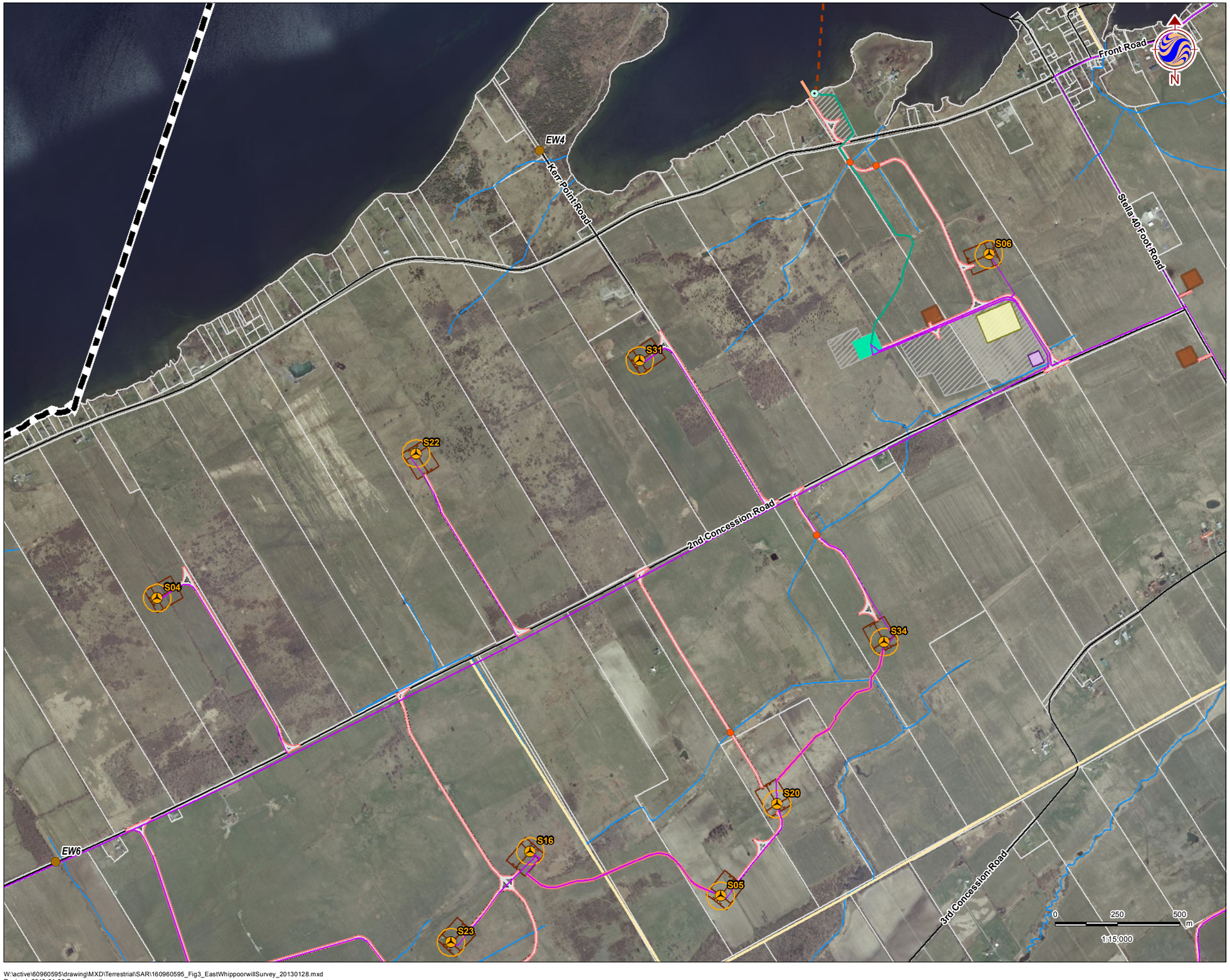
Figure No.

3.3

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

3.4

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

3.5

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

3.6

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

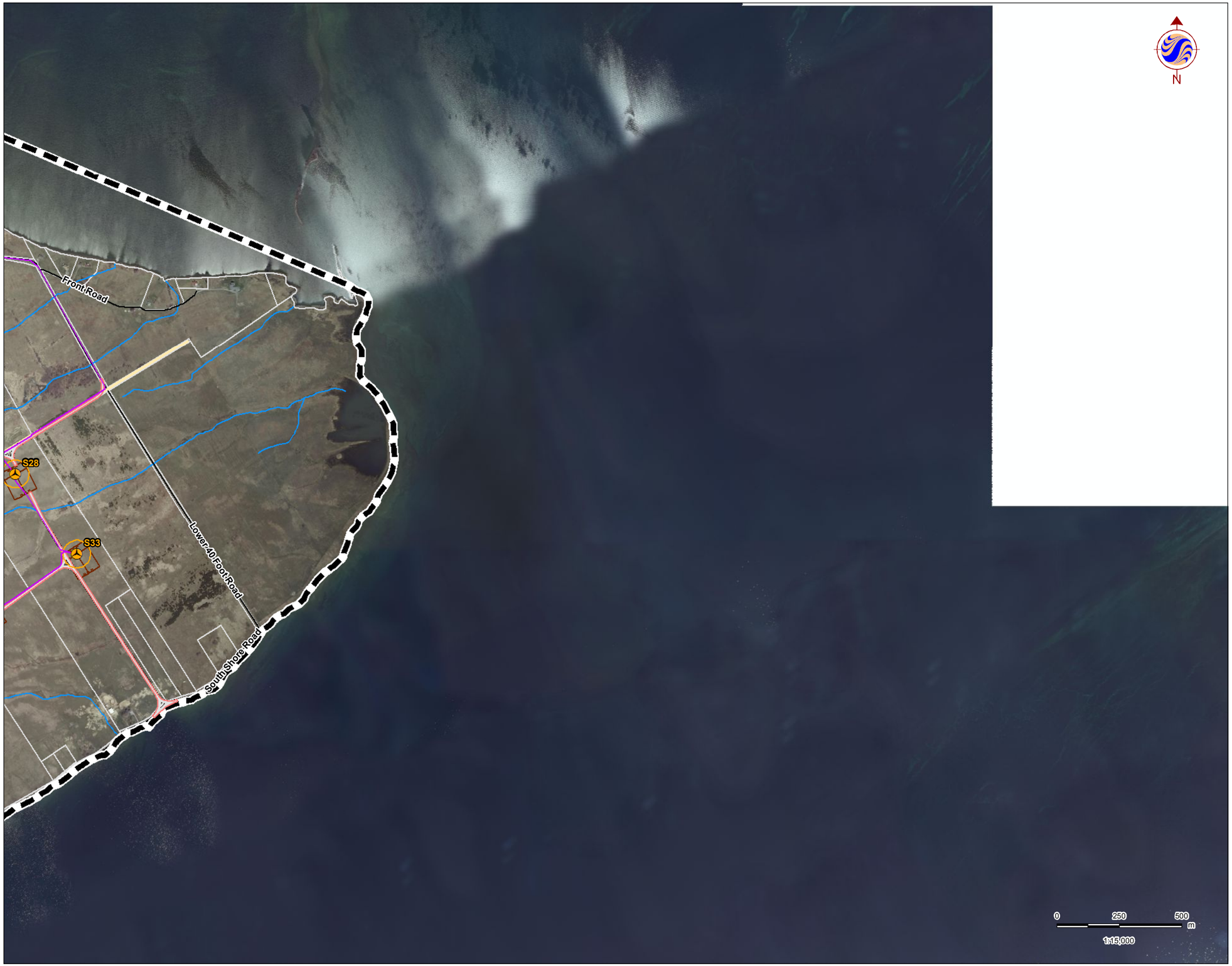
Figure No.

3.7

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential ocation)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line

Species Survey Stations

- Eastern Whip-poor-will Survey Station (EW)
- Eastern Whip-poor-will Call Observation
- Confirmed Eastern Whip-poor-will Habitat (EWH)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2013. Imagery Date: 2008

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

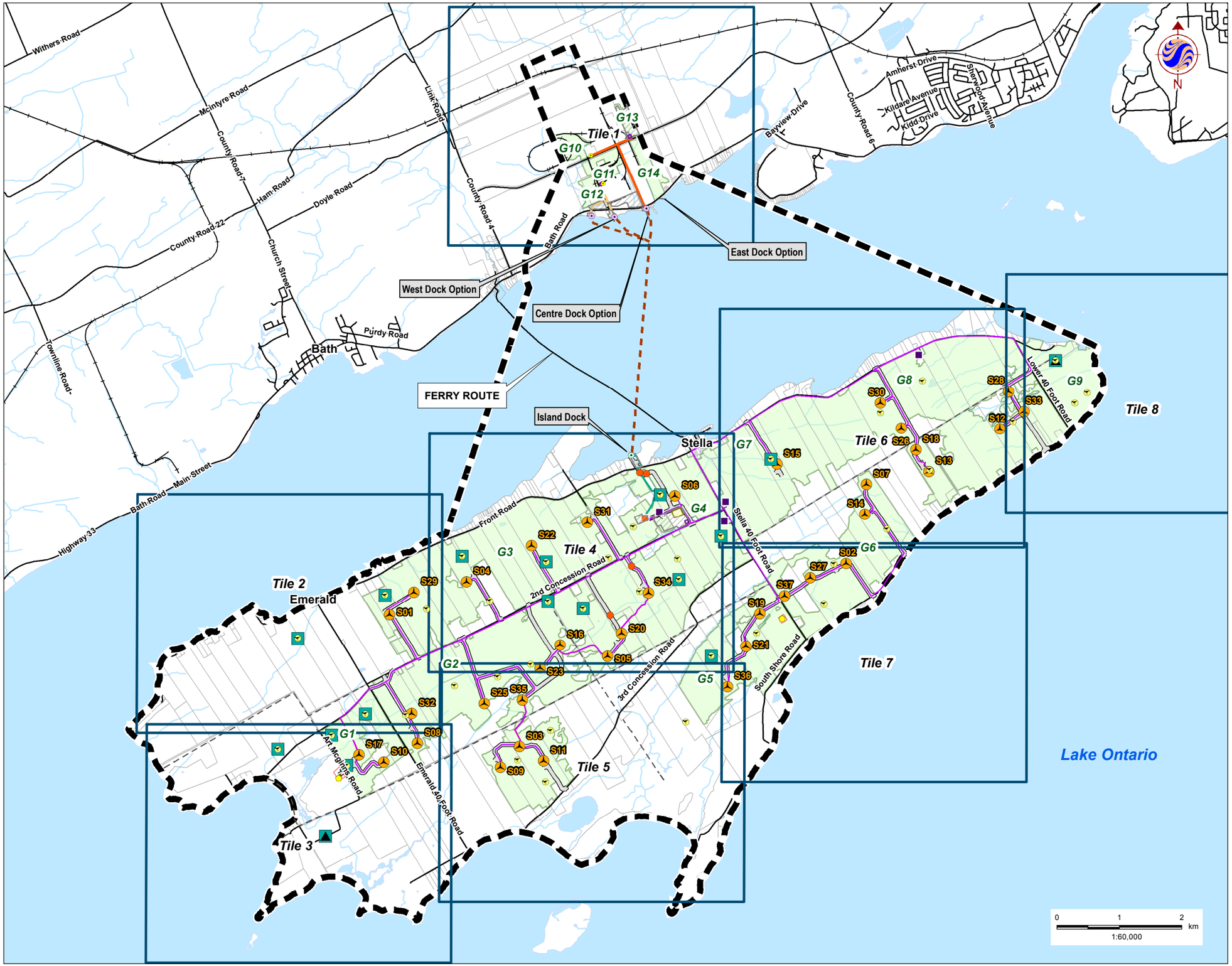
Figure No.

3.8

Title

Eastern Whip-poor-will Calling Survey Results & Habitat Mapping

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig3_EastWhippoorwillSurvey_20130128.mxd
Revised: 2013-01-28 By: pworsell



Legend

- Project Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Property Boundary
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

4.0

Title

Grassland Habitat & Species Occurrences - Overview

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_Overview_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

4.1

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

4.2

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

4.3

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

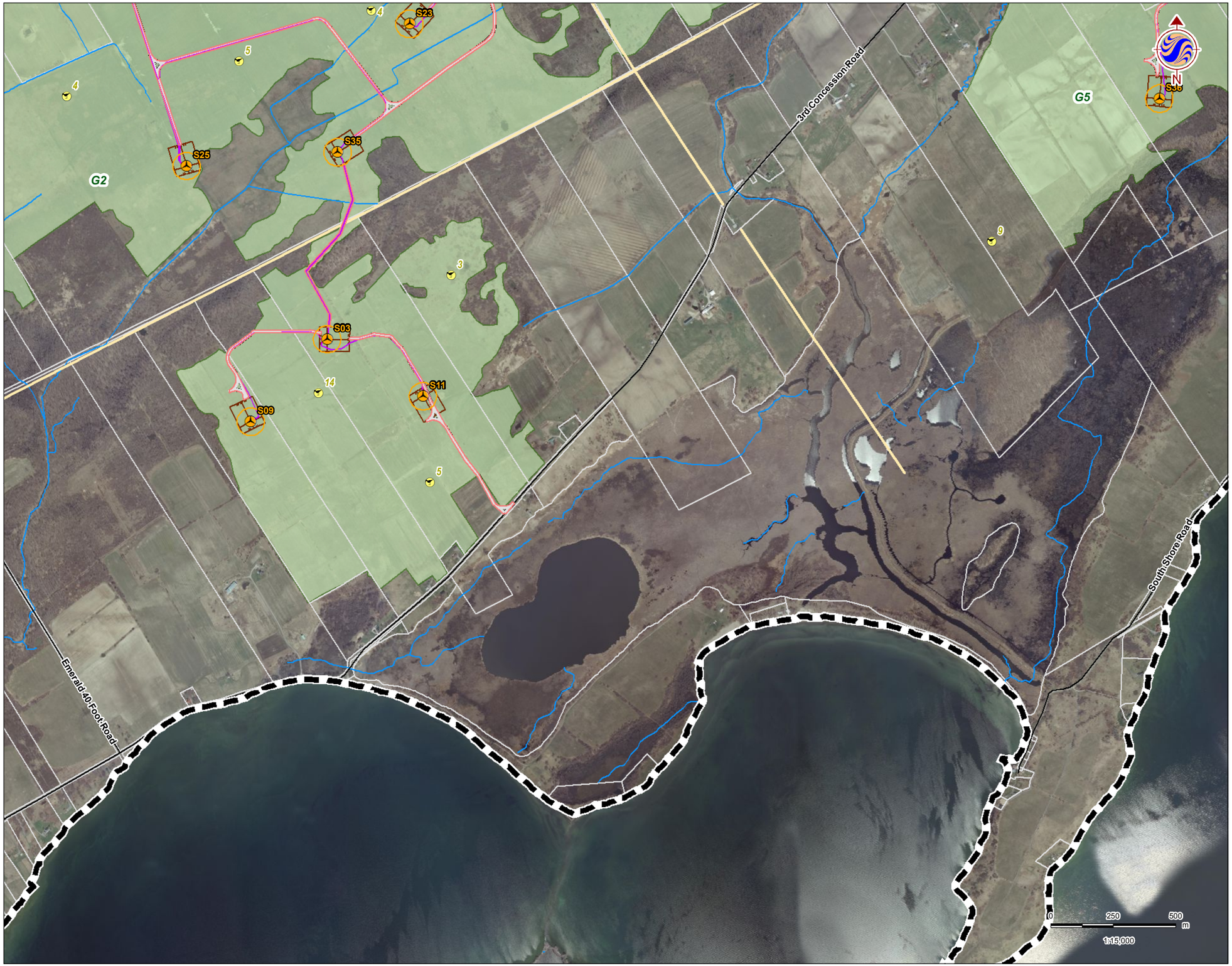
Figure No.

4.4

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

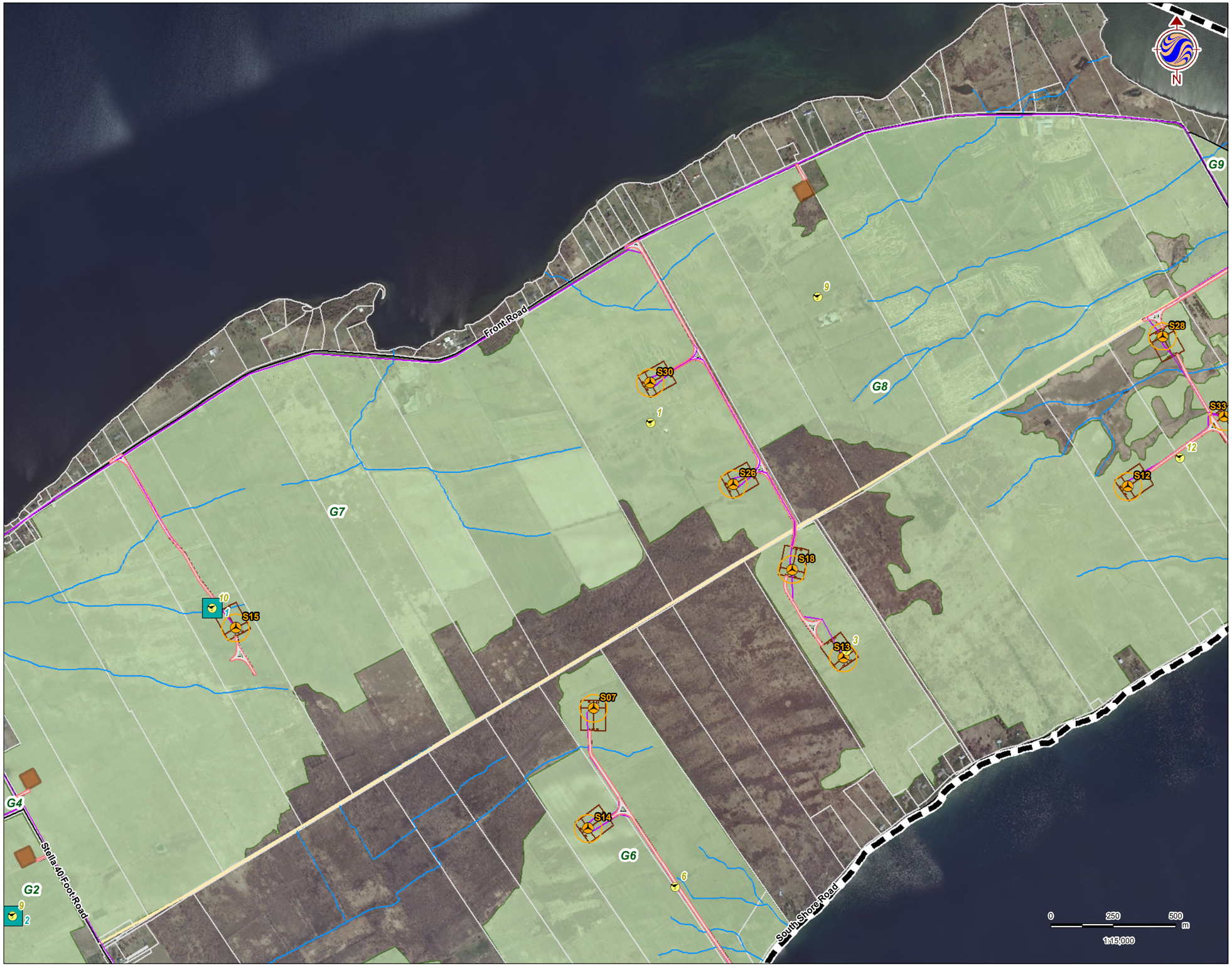
Figure No.

4.5

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

4.6

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

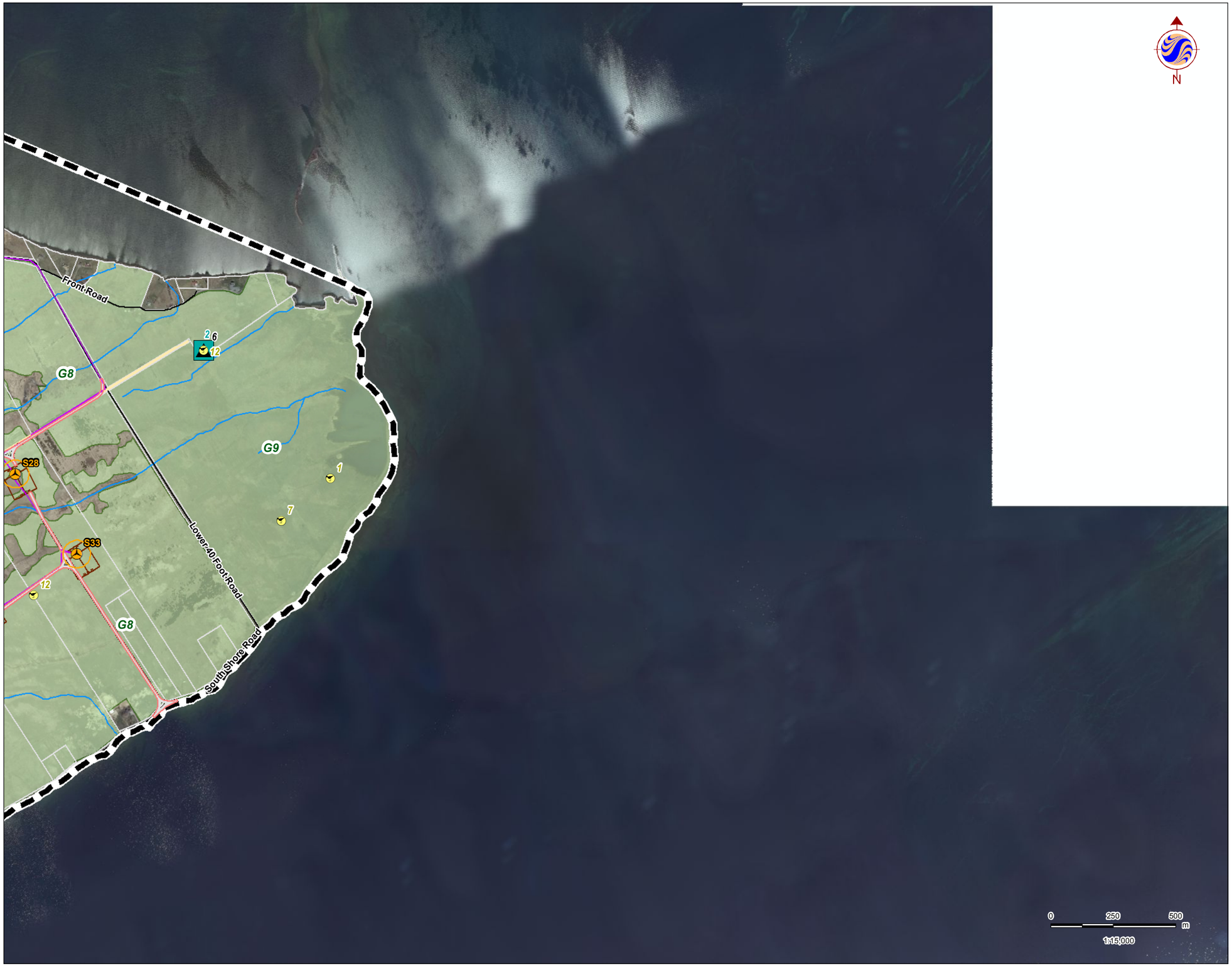
Figure No.

4.7

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Laydown Area and Crane Path
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Storage Shed
- Turbine Blade Tips
- Substation (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Property Line
- Grassland Bird Habitat (G)

Grassland Bird Species Observations

- Barn Swallow
- Bobolink
- Eastern Meadowlark

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012. Project layout S19 - revision 3.
3. Imagery Source: First Base Solutions ©, 2012. Imagery Date: 2008.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

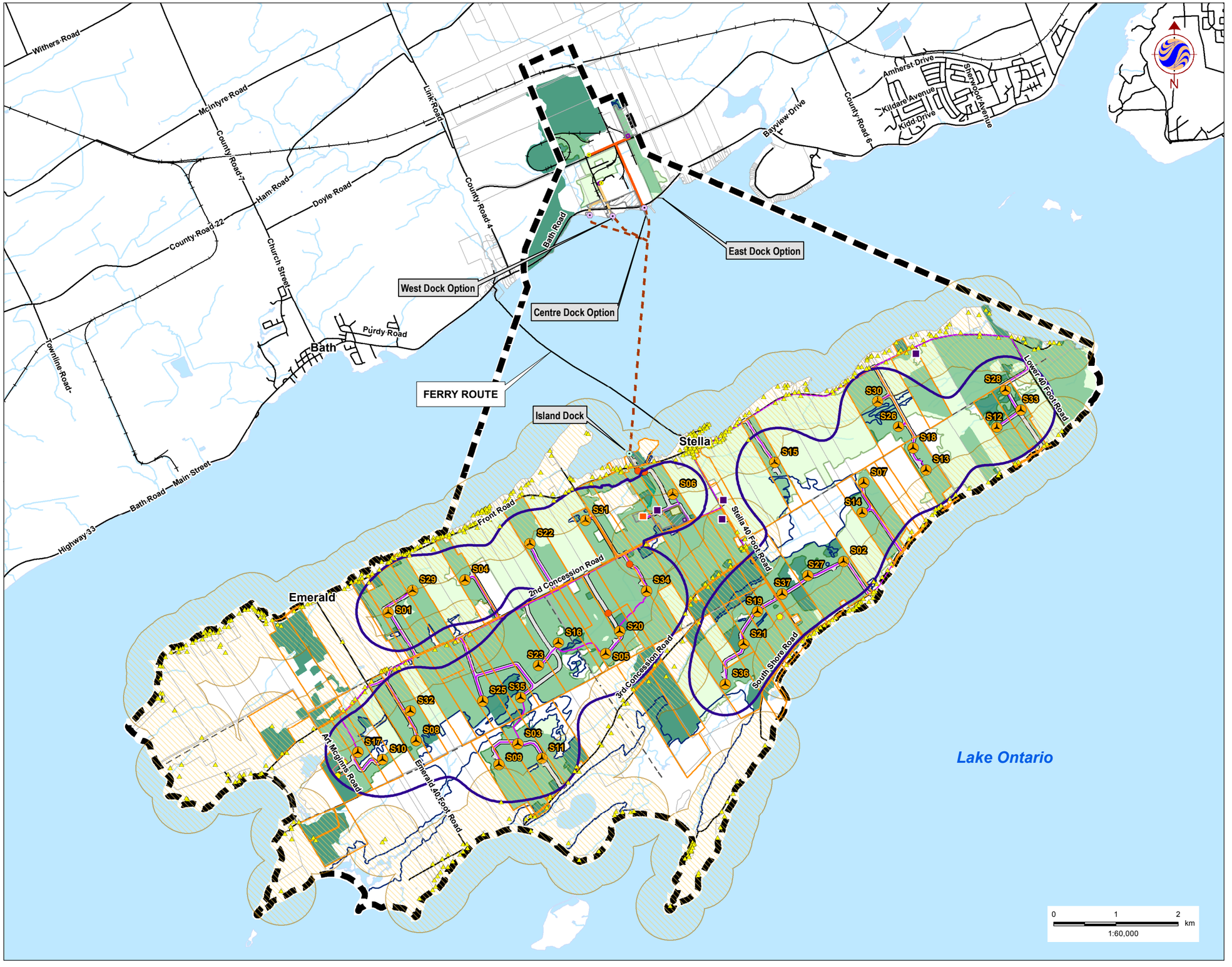
Figure No.

4.8

Title

Grassland Habitat & Species Occurrences

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig4_GrasslandHabitat_SpeciesOcc_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Project Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed
- Optioned Property

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Property Boundary

Significant Natural Features

- Wetland (Stantec)

Species at Risk

- Grassland Bird Habitat

Breeding Bird Area Search Unit

- Grassland Breeding Bird

Noise

- Non-Participating Dwelling
- 40dB Isobel
- 550m Noise Receptor Setback

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

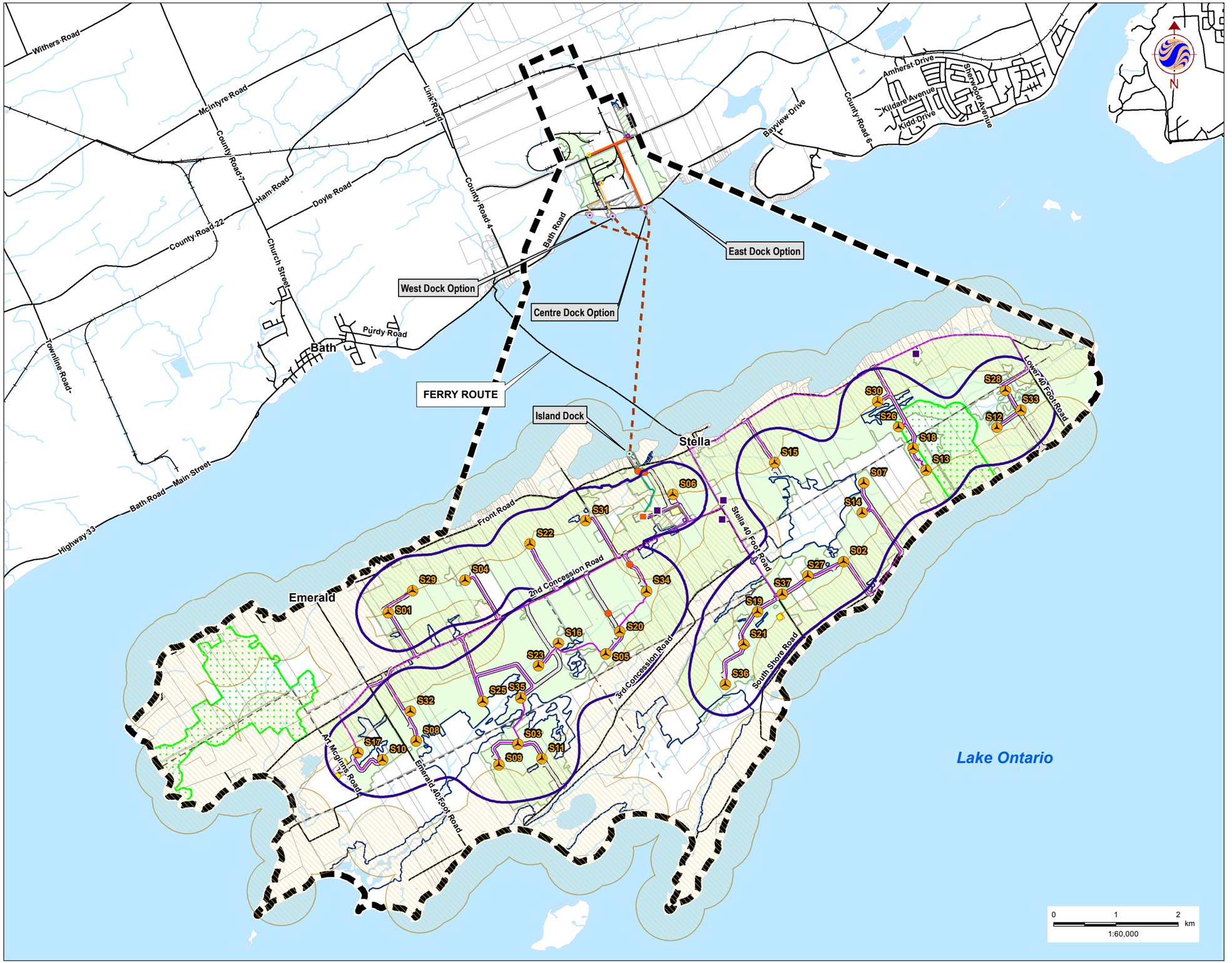
Figure No.

5.0

Title

Primary Siting Constraints

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig5_PrimarySitingConstraints_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Project Study Area

Project Components

- Turbine
- Met Tower (Potential Location)
- Substation (Potential Location)
- Access Road
- Collector Lines
- Submarine Cable Path
- Operation and Maintenance Building (Potential Location)
- Potential Culvert Location
- Point of Common Coupling
- Mainland Cable Vault (Potential Location)
- Island Cable Vault
- Constructible Area
- Mainland Dock (Potential Location)
- Island Dock
- Batch Plant (Potential Location)
- Site Office (Potential Location)
- Storage Shed

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Land Use

- Central Staging Area
- Switching Station (Potential Location)

Existing Features

- Road
- Unopened Road Allowance
- Railway
- Watercourse
- Waterbody
- Property Boundary

Significant Natural Features

- Wetland (Stantec)

Species at Risk

- Grassland Bird Habitat
- Eastern Whip-poor-will Territory

Noise

- 40dB Isobel
- 550m Noise Receptor Setback

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Stantec

January 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

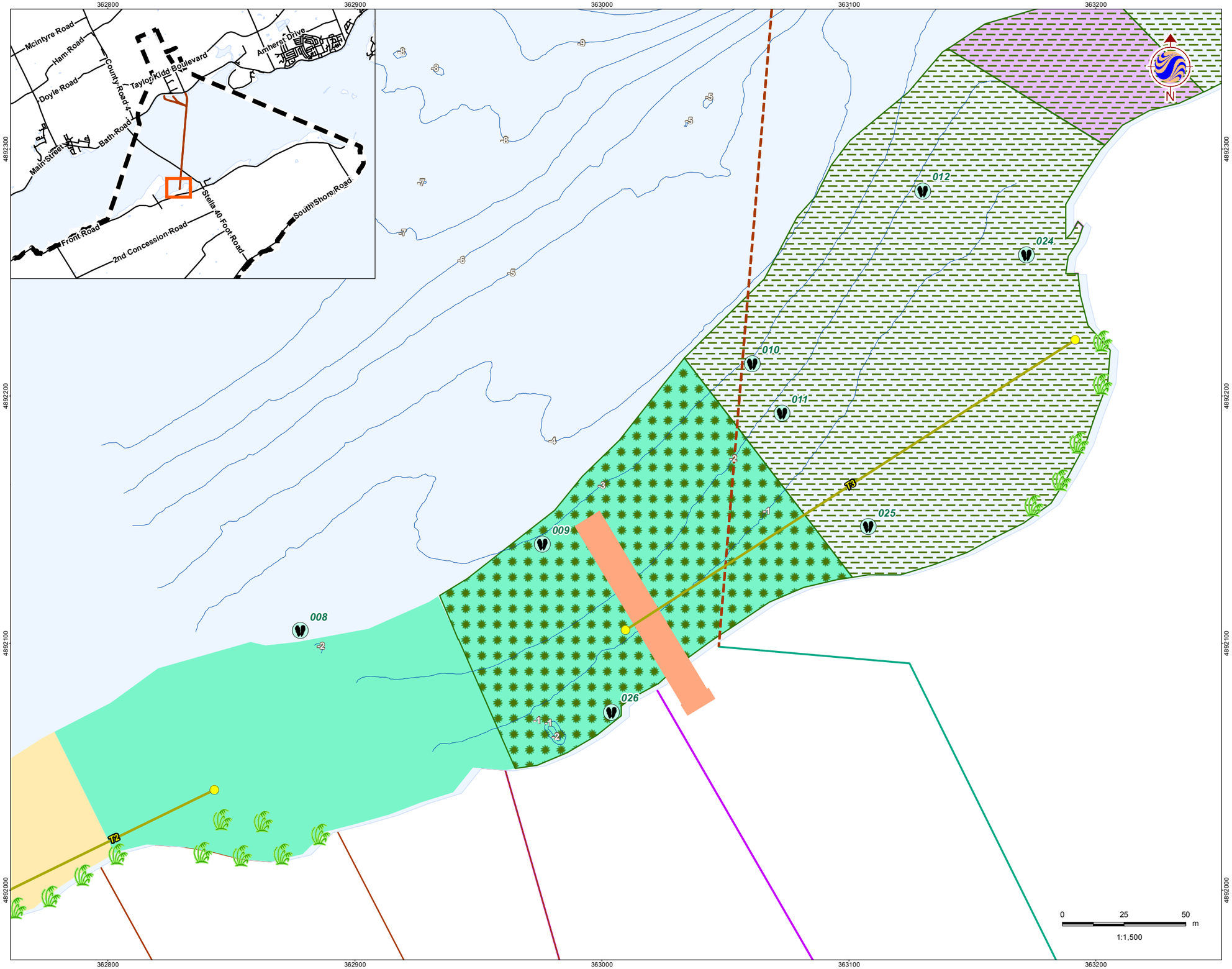
Figure No.

6.0

Title

Siting Constraints & Species at Risk Habitat

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig6_SitingConstraints_SAR_Habitat_20130128.mxd
Revised: 2013-01-28 By: pworsell



Legend

- Study Area
- Transformer
- Collector Line
- Unopened Road Allowance
- Bathymetry Contour (metres ASL)
- Road
- Watercourse
- Waterbody
- Optioned Property
- Property Boundary
- Mainland Dock (Potential Location)
- Island Dock
- Optional Cable Landing
- Submarine Cable Path

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Substrate

- Bedrock
- Cobble (patchy)
- Cobble/Sand
- Cobble/Sand/Gravel
- Sand
- Sand/Gravel
- Sand/Silt/Cobble
- Sand/Milfoil

Vegetation

- Milfoil
- Overhanging Terrestrial Vegetation
- Scattered, Sparse Submergent Vegetation
- Weedbed
- Weedbed/Scattered Vegetation
- Emergent Vegetation

Other

- Logs, in Water Cover
- Rocks
- Bass Bed/Nest

Fish Survey Locations

- FN1 Fyke Nets
- GN1 Gill Nets
- m1 Minnow Traps
- SN1 Seine Net
- T1 Electrofishing Transect
- 20 LOMU Fish Sampling Stations – 2009
- 010 Mussel Survey - Sept 2011

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January, 2013
160960595

Client/Project
WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

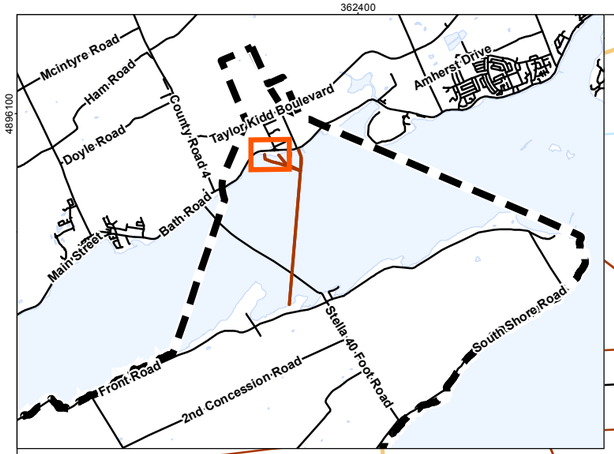
Figure No.
7.1

Title
Substrate and Bathymetry at Dock and Cable Landing Sites
Island Dock

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig7_Substrate_BathymetryDock_CableLanding_20130102.mxd
Revised: 2013-01-02 By: pworsell

362400 362500 362600 362700 362800

4896100 4896000 4895900 4895800



Bath Road

013

014

0 25 50 m

1:1,500

N

Legend

- Study Area
- Transformer
- Collector Line
- Unopened Road Allowance
- Bathymetry Contour (metres ASL)
- Road
- Watercourse
- Waterbody
- Optioned Property
- Property Boundary
- Mainland Dock (Potential Location)
- Island Dock
- Optional Cable Landing
- Submarine Cable Path

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Substrate

- Bedrock
- Cobble (patchy)
- Cobble/Sand
- Cobble/Sand/Gravel
- Sand
- Sand/Gravel
- Sand/Silt/Cobble
- Sand/Milfoil

Vegetation

- Milfoil
- Overhanging Terrestrial Vegetation
- Scattered, Sparse Submergent Vegetation
- Weedbed
- Weedbed/Scattered Vegetation
- Emergent Vegetation

Other

- Logs, in Water Cover
- Rocks
- Bass Bed/Nest

Fish Survey Locations

- FN1 Fyke Nets
- GN1 Gill Nets
- m1 Minnow Traps
- SN1 Seine Net
- T1 Electrofishing Transect
- 60 LOMU Fish Sampling Stations – 2009
- 010 Mussel Survey - Sept 2011

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

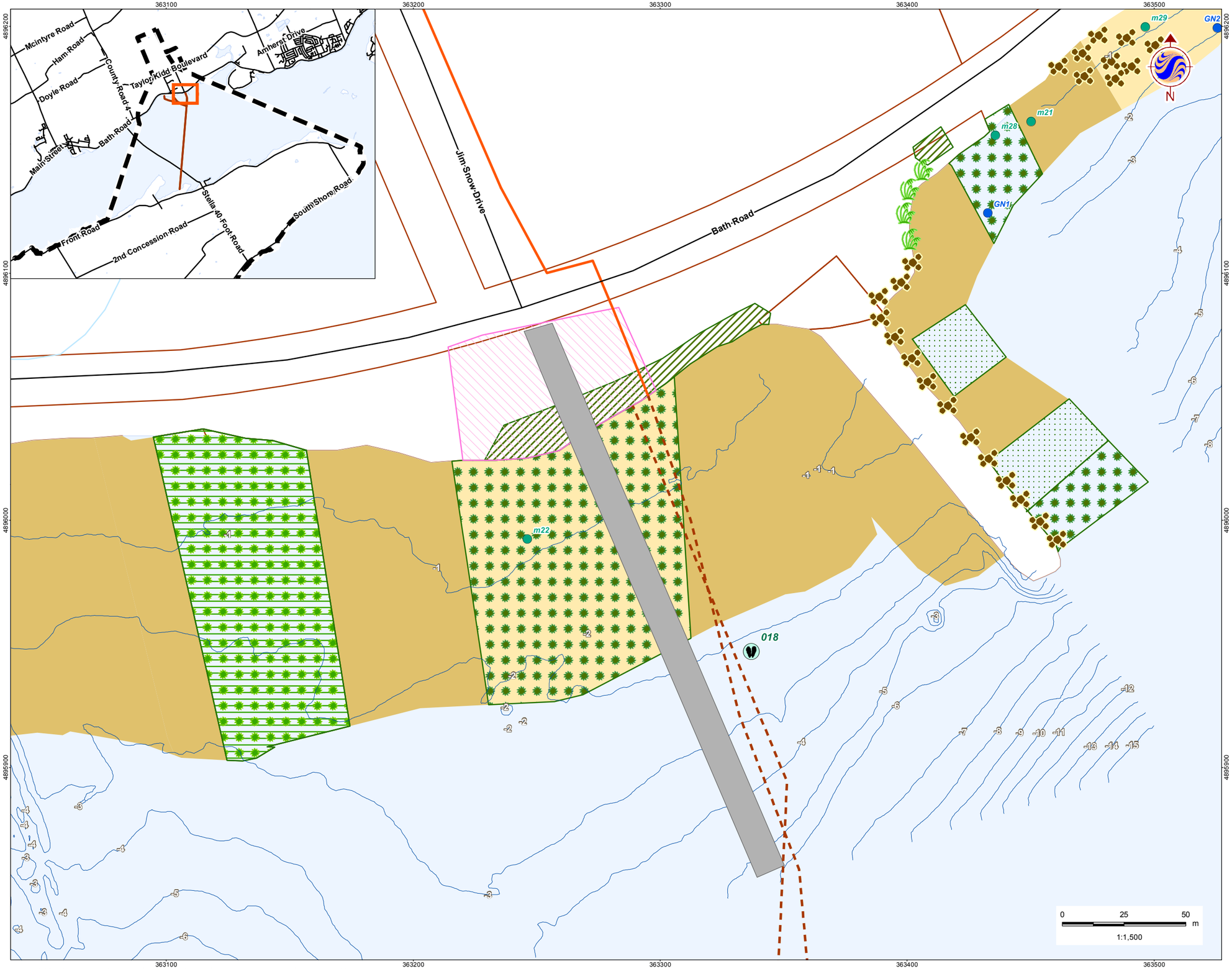
January, 2013
160960595

Client/Project
WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.
7.2

Title
Substrate and Bathymetry at Dock and Cable Landing Sites
Mainland Dock – West Option and Optional Cable Landing Area

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig7_Substrate_BathymetryDock_CableLanding_20130102.mxd
Revised: 2013-01-02 By: pworsell



Legend

- Study Area
- Transformer
- Collector Line
- Unopened Road Allowance
- Bathymetry Contour (metres ASL)
- Road
- Watercourse
- Waterbody
- Optioned Property
- Property Boundary
- Mainland Dock (Potential Location)
- Island Dock
- Optional Cable Landing
- Submarine Cable Path

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Substrate

- Bedrock
- Cobble (patchy)
- Cobble/Sand
- Cobble/Sand/Gravel
- Sand
- Sand/Gravel
- Sand/Silt/Cobble
- Sand/Milfoil

Vegetation

- Milfoil
- Overhanging Terrestrial Vegetation
- Scattered, Sparse Submergent Vegetation
- Weedbed
- Weedbed/Scattered Vegetation
- Emergent Vegetation

Other

- Logs, in Water Cover
- Rocks
- Bass Bed/Nest

Fish Survey Locations

- FN1 Fyke Nets
- GN1 Gill Nets
- m1 Minnow Traps
- SN1 Seine Net
- T1 Electrofishing Transect
- 09 LOMU Fish Sampling Stations – 2009
- 010 Mussel Survey - Sept 2011

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January, 2013
160960595

Client/Project

WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.

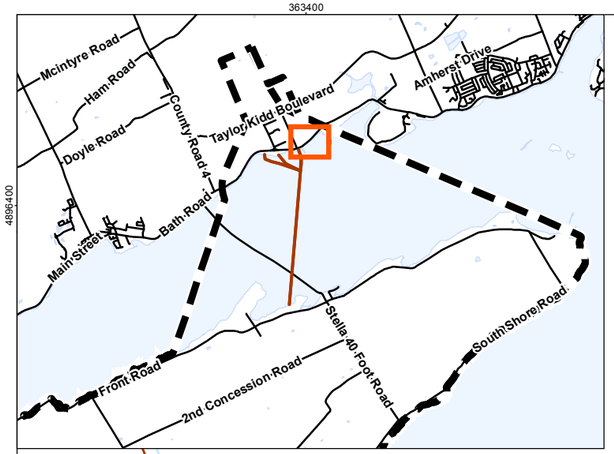
7.3

Title

Substrate and Bathymetry at Dock and Cable Landing Sites

Mainland Dock – Centre Option

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig7_Substrate_BathymetryDock_CableLanding_20130102.mxd
Revised: 2013-01-02 By: pworsell



363400 363500 363600 363700 363800

4896400 4896300 4896200 4896100

Bath Road

m3 m30 m20 m29 m21 m28 GN2 GN1

-1 -2 -3 -4 -5 -6 -7

0 25 50 m

1:1,500

W:\active\60960595\drawing\MXD\Terrestrial\SAR\160960595_Fig7_Substrate_BathymetryDock_CableLanding_20130102.mxd
Revised: 2013-01-02 By: pworsell

Legend

- Study Area
- Transformer
- Collector Line
- Unopened Road Allowance
- Bathymetry Contour (metres ASL)
- Road
- Watercourse
- Waterbody
- Optioned Property
- Property Boundary
- Mainland Dock (Potential Location)
- Island Dock
- Optional Cable Landing
- Submarine Cable Path

Transmission Lines

- Mainland Option1
- Mainland Option 2
- Island Transmission Line

Substrate

- Bedrock
- Cobble (patchy)
- Cobble/Sand
- Cobble/Sand/Gravel
- Sand
- Sand/Gravel
- Sand/Silt/Cobble
- Sand/Milfoil

Vegetation

- Milfoil
- Overhanging Terrestrial Vegetation
- Scattered, Sparse Submergent Vegetation
- Weedbed
- Weedbed/Scattered Vegetation
- Emergent Vegetation

Other

- Logs, in Water Cover
- Rocks
- Bass Bed/Nest

Fish Survey Locations

- FN1 Fyke Nets
- GN1 Gill Nets
- m1 Minnow Traps
- SN1 Seine Net
- T1 Electrofishing Transect
- 60 LOMU Fish Sampling Stations – 2009
- 910 Mussel Survey - Sept 2011

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Stantec

January, 2013
160960595

Client/Project
WINDLECTRIC INC.
AMHERST ISLAND WIND ENERGY PROJECT

Figure No.
7.4

Title
Substrate and Bathymetry at Dock and Cable Landing Sites
Mainland Dock – East Option

Appendix B

Tables

Table 1.1: Key Project Activities

Project Phase	Activities
Construction	**Private Lands - Turbine and Substation Sites**
	Delineation of temporary work areas
	Preparation of laydown areas
	Installation of docks on mainland and island
	Installation of submarine cabling
	Access road construction
	Substation construction
	Completion of necessary site grading
	Installation of tower and substation foundations
	Installation of crane pads
	Tower/turbine erection
	Installation of step-up transformer and required wiring
	Installation of collector lines, usually parallel to access roads
	Reclamation of temporary work areas
	Site landscaping (final grading, topsoil replacement, etc.)
	Off-site Activities - Municipal Road Allowance
	Installation of collector lines and May/Fry interconnection line
Operation	**Private Lands - Turbine and Substation Sites**
	Preventative maintenance
	Unplanned maintenance
	Access road maintenance and snow clearing
	Meter calibrations
	Grounds keeping
	Remote turbine condition monitoring
	Off-site Activities - Municipal Road Allowance
	Electrical line maintenance and inspection
Decommissioning	**Private Lands - Turbine and Substation Sites**
	Removal of turbine infrastructure and step-up transformers
	Removal of docks and submarine cabling
	Site grading (dependent upon new proposed use)
	Possible removal of access roads dependent upon agreement with property owner
	Possible excavation and removal of collector lines depending upon agreement with property owner
	Disconnection of substations from provincial grid
	Removal of substations
	Off-site Activities - Municipal Road Allowance
	Possible removal of collector system and May/Fry interconnection line

Table 1.2 Construction Timeline

Phase Details	Approximate Schedule
Surveying	3-7 weeks
Delivery of construction materials, storage materials, site preparation, construction of access roads, crane pads and temporary dock	5-9 months
Installation of tower foundations	8-12 months
Tower/turbine delivery and erection	6-8 months
Installation of submarine cables	2-4 weeks
Installation of collector lines and transmission line	6-9 months
Installation of substation	4-7 months
Installation of operations and maintenance building	1-3 months
Installation of interconnect facility and switching station	1-4 months
Installation of switching station	2-5 months
Installation of batch plant	1-2 months
Installation of temporary site office	1 -2 months
Reclamation of temporary work areas, final grading, topsoil replacement	4-7 months
Project Testing/ Commission	3-6 months
Commercial Operation	1 week

Note: Construction activities will take place during normal business hours. When construction is anticipated to be required outside of normal business hours, the timing will be discussed in advance with Loyalist Township. In the event changes are required to the proposed construction schedule, updated construction schedules will be provided to the public through postings on the Project website (www.amherstislandwindproject.com).

Table 2.1: Amherst Island Project Area: Threatened and Endangered Species Identified through Records Review

Common Name	Scientific Name	S-Rank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat	Record of Known Occurrences
Vegetation							
Butternut	*Juglans cinerea*	S3	END	END	MNR	Found in a variety of habitat including woodlands and hedgerows. It is generally shade intolerant, most frequently found in early successional habitat. However, it can occasionally make up a minor component of mature forested community (COSEWIC 2003).	Known occurrences within Loyalist Township (MNR, personal communication, 2011; NHIC, 2010).
Reptiles							
Eastern Musk Turtle	*Sternotherus odoratus*	S3	THR	THR	MNR, NHIC, OHA	The Eastern Musk Turtle, also known as Stinkpot, is a small, aquatic freshwater turtle. It is found scattered across south-central Ontario, ranging from the southern edge of the Canadian Shield from Georgian Bay to the Ottawa-Hull region. In Canada, stinkpots have been found in lakes, streams, marshes, ponds and rivers. Suitable stinkpot habitat is abundant across south-central Ontario, especially in the Canadian Shield Region. The Eastern Musk Turtle require aquatic habitats with soft substrate and shallow water with little to no current. Nesting occurs in areas close to the water with direct exposure to sunlight. This species is highly aquatic, and rarely leaves the water (COSEWIC, 2002).	NHIC records indicate the most recent reported occurrences were in 2002 (NHIC, 2010). It is uncommon in this region; however, it is rarely observed outside of water and forages along the bottom of ponds/lakes it can be hard to adequately assess its population.
Blanding's Turtle	*Emydoidea blandingi*	S3	THR	THR	MNR, NHIC, OHA	Occur in ponds, lakes, streams, swamps and marshes, often with soft substrates and usually shallower than 2 m in depth (COSEWIC 2005a). They have a preference for larger bodies of water. In Prince Edward County, they are abundant in stream mouths and lake end marshes (Christie, 1997).	NHIC records indicate the most recent reported occurrences were in 1986 (NHIC, 2010; MNR, personal communication, 2011). The suitable habitat available on Amherst Island occurs in the coastal marshes.
Birds							
Least Bittern	*Ixobrychus exilis*	S4B	THR	THR	NHIC, OBBA	Least Bittern require freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs *et al.*, 1992).	Suitable habitat occurs on Amherst Island within the coastal marshes. (MNR, personal communication, 2011).

Table 2.1: Amherst Island Project Area: Threatened and Endangered Species Identified through Records Review

Common Name	Scientific Name	S-Rank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat	Record of Known Occurrences
Eastern Whip-poor-will	*Caprimulgus vociferous*	S4B	THR	THR	MNR, OBBA	In Ontario, the Whip-poor-will breeds in dry open woodland and is typically associated with forest edges and openings. It prefers rock or sand barrens with scattered trees, savannahs, old burns in a state of early forest succession, and open conifer plantations for breeding (Cadman et al., 2007). Pastures, shrubby meadows, pipeline and hydro rights-of-way adjacent to, or in, extensive forests may provide good nesting habitat. Whip-poor-will are considered an area-sensitive species that requires extensive forest and breeding area of at least 100 hectares to support more than a few pairs (Sandilands, 2010).	The Eastern Whip-poor-will was identified by background sources as historically present within the vicinity of the Project Study Area. Eastern Whip-poor-will was identified during the first (1981-1985; Cadman et al. 1987) and second Ontario Breeding Bird Atlas (2001-2005; Cadman et al. 2007).
Barn Swallow	*Hirundo rustica*	S4	THR	THR	OBBA	As their name suggests, Barn Swallows nest on walls or ledges of barns, as well as on other human-made structures such as bridges, culverts or other buildings (Cadman et al., 2007). Where suitable nesting structures occur, Barn Swallow often form small colonies, sometimes mixed with Cliff Swallows. Barns Swallows feed on aerial insects while foraging in open habitat. Barn Swallows are generally considered grassland species, foraging over meadows, hay, pasture or even mown lawn. They will also frequency forage in woodland clearings, over wetland habitats or open water where insect prey are abundant.	Considered a very common species in the region. The species was confirmed as breeding in every 10 km square in Loyalist Township as part of the Ontario Breeding Bird Atlas (2001-2005).
Henslow's Sparrow	*Ammodramus henslowii*	SHB	END	END	MNR, NHIC, OBBA	The Henslow's Sparrow is a species of open habitats, consisting of weedy fields and meadows, preferably moist, with a mixture of grasses, forbs and scattered shrubs (Herkert et al., 2002). In general, this species prefers large areas of tall, dense grass with a well-developed litter layer and standing dead forb vegetation for singing perches. Sparse to no woody vegetation is important. They have also been known to have a preference for flatter portions of fields. Henslow's Sparrows are area sensitive, generally requiring 50 hectares of more of suitable nesting habitat (Herkert, 1991).	Henslow's Sparrow was present in the vicinity of the Project Study Area between 1981 and 1985 (Cadman et al. 1987) but was not observed between 2001 and 2005 (Cadman et al. 2007).

Table 2.1: Amherst Island Project Area: Threatened and Endangered Species Identified through Records Review

Common Name	Scientific Name	S-Rank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat	Record of Known Occurrences
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR-NS	MNR, OBBA	The Bobolink is generally referred to as a "grassland species". It nests primarily in forage crops with a relatively high proportion of grasses, predominantly hayfields and pastures. Preferred ground cover includes cool season grasses such as timothy and Kentucky bluegrass and forbs such as clover and dandelion (COSEWIC, 2010).	Bobolink was confirmed breeding in the vicinity of the Project Study Area between 1981 and 1985 (Cadman et al. 1987) and between 2001 and 2005 (Cadman et al. 2007).
Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR	OBBA	Meadowlarks are ground nesting birds (Harrison, 1975), which are often associated with human-modified habitats where they sings from prominent perches such as roadside wires, trees, and fence posts. As a grassland species the Eastern Meadowlark typically occurring in meadows, hayfields and pastures. However, it will utilize a wider range of habitat than most grassland species, including mown lawn (e.g. golf course, parks), wooded city ravines, young conifer plantations and orchards (Peck and James, 1983). The Eastern Meadowlark is generally tolerant of habitat with early succession of trees or shrubs. As with other grassland species, current threats are primarily the result of expanding urbanization and intensive farming practices (Cadman et al., 2007).	Eastern Meadowlark was confirmed breeding in the vicinity of the Project Study Area between 1981 and 1985 (Cadman et al. 1987) and between 2001 and 2005 (Cadman et al. 2007).
Mammals							
Little Brown Bat	*Myotis lucifugus*	S5	END	END	OMA, MNR	This species up until recently was considered the most common bat species in Ontario, and most frequently found bat species in North America. The recent change in status is due to significant declines in recent years attributed to a condition referred to as White-nose Syndrome (WNS). A widespread species, the Little Brown Bat is commonly found near waterbodies in buildings, attics, roof crevices and loose bark on trees or under bridges (Eder, 2002).	This species is known from the general region as recorded in the Ontario Mammal Atlas.
Northern Long-eared Bat	*Myotis septentrionalis*	S3?	END	END	OMA, MNR	The Northern Long-eared Bat is a resident bat of upland forests of eastern North America, typically foraging for aerial insects in the forest understory. Maternity roosts are located under	This species is known from the general region as recorded in the Ontario Mammal Atlas.

Table 2.1: Amherst Island Project Area: Threatened and Endangered Species Identified through Records Review

Common Name	Scientific Name	S-Rank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat	Record of Known Occurrences
						bark or in buildings with young born in June and July while hibernating colonies typically reside in cave crevices (Reid, 2006).	
Fish							
Spotted Gar	*Lepisosteus oculatus*	S1	THR	THR	MNR, DFO	Quiet backwater areas of calm, clear, shallow water (< 1 m deep). Dense submergent and emergent vegetation, mixture of sand, silt, clay or muck substrate.	1985 record (anomalous) from the Bay of Quinte. No recognized population in the area. Federal (DFO) Proposed Recovery Strategy available (Staton et al, 2012)
American Eel	*Anguilla rostrata*	S1?	END	SC	MNR, DFO	No breeding habitat in freshwater. Freshwater habitats are diverse over most of the year; eels overwinter in soft substrates	Found in Lake Ontario tributaries including Millhaven Creek (east of the Study Area). Known to occur in Lake Ontario. Draft Recovery Strategy available (MacGregor et al, 2010)
Eastern Pondmussel	*Ligumia nasuta*	S1	END	END	MNR, DFO	N/A	DFO considers the species to be extirpated from the area

List of Terms:
COSSARO: Committee on the Status of Species at Risk in Ontario
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
S1: Critically Imperiled – Critically imperiled in the province, 5 or fewer populations
S2: Imperiled – Imperiled in the province, very few populations
S3: Vulnerable – Vulnerable in the province, relative few populations
S4: Apparently Secure – Uncommon but not rare
S#B: Breeding status rank
S#N: Non Breeding status rank
? after S-Rank: Rank uncertain
THR: Threatened
SC: Special Concern
NS after COSEWIC ranking: No Schedule of the Species At Risk Act (SARA)
OBBA: Ontario Breeding Bird Atlas
NHIC: Natural Heritage Information Center
IBA: Important Bird Areas
OHA: Ontario Herpetofaunal Atlas
OMA: Ontario Mammal Atlas

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
7/26/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	22	30	0	2	n/a
7/27/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	23	20	0	3	n/a
7/28/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	26	70	0	2	n/a
7/29/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	21	100	Rain	2	n/a
8/2/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	26	10	0	3	n/a
8/3/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	22	90	0	3	n/a
8/4/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	26	0	0	2	n/a
8/5/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	27	10	0	2	n/a
8/17/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	23	30	0	2	n/a
8/18/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	22	haze	0	2	n/a
8/19/2011	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	25	5	0	2	n/a
11/11/2011	ELC, botanical surveys, and wildlife habitat assessments	Josh Mansell	8hr	2	60	0	3	n/a
3/27/2012	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	4	10	0	2	n/a
3/28/2012	ELC, botanical surveys, and wildlife habitat assessments	James Leslie	8hr	4	80	0	2	n/a
5/18/2012	ELC, botanical surveys, and wildlife habitat assessments	Josh Mansell	8hr	5	80	0	2	n/a
8/15/2012	ELC, botanical surveys, and wildlife habitat assessments	Katherine St. James	4hr	28	60	0	2	n/a
6/11/11, 5:00-9:57	Breeding Bird Surveys and Point Counts (P1, P2, G1, G2, W1, W2)	P. Read	4hr 57min	15	80	0	1	n/a
6/24/2011, 6:15-10:45	Breeding Bird Surveys and Point Counts (P1, P2, G1, G2, W1, W2)	A. Wormington	4hr 47min	22	90	0	2	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
7/12/2011, 5:19-10:30	Breeding Bird Surveys and Point Counts (P1, P2, G1, G2, W1, W2)	A. Wormington	1hr 23min	23	100	0	1	n/a
6/3/2011, 5:00-10:45	Breeding Bird Surveys and Point Counts (P19-P23, G9, G13, G16, G17, W13, W15, W21, W30, W31, W33)	P. Read	5hr 45min	13	0	0	1	n/a
6/17/2011, 5:20-12:02	Breeding Bird Surveys and Point Counts (P19-P23, G9, G13, G16, G17, W13, W15, W21, W30, W31, W33)	A. Wormington	6hr 45min	13	10	0	2	n/a
7/3/2011, 5:59-10:53	Breeding Bird Surveys and Point Counts (P19-P23, G9, G13, G16, G17, W13, W15, W21, W30, W31, W33)	A. Wormington	4hr 55min	22	100	0	0	n/a
6/5/2011, 5:15-11:10	Breeding Bird Surveys and Point Counts (P24, P28-P30, P32, P34, P62, P63, G14, G15, G20, W15, W33, W34, W36, W37, M3)	P. Read	5hr 55min	12	90	0	0	n/a
6/21/2011, 9:03-10:35	Breeding Bird Surveys and Point Counts (P24, P28-P30, P32, P34, P62, P63, G14, G15, G20, W15, W33, W34, W36, W37, M3)	A. Wormington	5hr 50min	11	10	0	1	n/a
7/7/2011, 5:50-10:22	Breeding Bird Surveys and Point Counts (P24, P28-P30, P32, P34, P62, P63, G14, G15, G20, W15, W33, W34, W36, W37, M3)	A. Wormington	5hr 40min	15	0	0	1	n/a
6/4/2011, 4:50-10:52	Breeding Bird Surveys and Point Counts (P27, P39, P40, P41, P42, G19, G22, G23, W24, W25, W27-W29)	P. Read	6hr 2min	13	80	0	1	n/a
6/18/2011, 5:43-9:41	Breeding Bird Surveys and Point Counts (P27, P39, P40, P41, P42, G19, G22, G23, W24, W25, W27-W29)	A. Wormington	5hr 17min	13	30	0	0	n/a
7/4/2011, 5:50-10:33	Breeding Bird Surveys and Point Counts (P27, P39, P40, P41, P42, G19, G22, G23, W24, W25, W27-W29)	A. Wormington	4hr 30min	15	50	0	1	n/a
6/6/2011, 5:00-9:38	Breeding Bird Surveys and Point Counts (P31, P33, P35, P43, P44,	P. Read	4hr 38min	12	0	fog	0	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
	G18, G21, G24, G25, W26, W32, W33)							
6/19/2011, 5:36-11:00	Breeding Bird Surveys and Point Counts (P31, P33, P35, P43, P44, G18, G21, G24, G25, W26, W32, W33)	A. Wormington	5hr 11min	10	10	0	0	n/a
7/5/2011, 6:46-9:18	Breeding Bird Surveys and Point Counts (P31, P33, P35, P43, P44, G18, G21, G24, G25, W26, W32, W33)	A. Wormington	4hr 35min	20	10	0	1	n/a
6/7/2011, 5:00-9:58	Breeding Bird Surveys and Point Counts (P36-P38, P47, G26-28, G30, W34, W35,W38, W40-W42, M4)	P. Read	4hr 58min	13	40	0	1	n/a
6/20/2011, 5:58-8:42	Breeding Bird Surveys and Point Counts (P36-P38, P47, G26-28, G30, W34, W35,W38, W40-W42, M4)	A. Wormington	6hr 42min	10	40	0	1	n/a
7/6/2011, 5:36-9:22	Breeding Bird Surveys and Point Counts (P36-P38, P47, G26-28, G30, W34, W35,W38, W40-W42, M4)	A. Wormington	4hr 54min	17	50	0	1	n/a
5/30/2011, 6:10-10:00	Breeding Bird Surveys and Point Counts (P3-P5, P14, G3, G5-G9, W3, W6, M1)	P. Read	3hr 50min	16	80	0	0	n/a
6/15/11, 5:30-12:15	Breeding Bird Surveys and Point Counts (P3-P5, P14, G3, G5-G9, W3, W6, M1)	A. Wormington	5hrs 6min	12	10	0	3	n/a
6/27/2011, 5:42-9:13	Breeding Bird Surveys and Point Counts (P3-P5, P14, G3, G5-G9, W3, W6, M1)	A. Wormington	3hr 10min	18	0	0	0	n/a
6/30/2011, 6:10-11:05	Breeding Bird Surveys and Point Counts (P3-P5, P14, G3, G5-G9, W3, W6, M1)	A. Wormington	4hr 12min	16	10	0	1	n/a
6/9/2011, 5:00-10:25	Breeding Bird Surveys and Point Counts (P45, P46, P52, P53, P55, P56, G29, G33, G35, G36, W38, W43,W45)	P. Read	5hr 25min	15	40	0	2	n/a
6/23/2011, 5:40-8:50	Breeding Bird Surveys and Point Counts (P45, P46, P52, P53, P55, P56, G29, G33, G35, G36, W38, W43,W45)	A. Wormington	3hr 10min	22	40	trace	2	n/a
7/10/2011, 5:30-12:15	Breeding Bird Surveys and Point	A. Wormington	4hr 32min	18	70	0	1	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
	Counts (P45, P46, P52, P53, P55, P56, G29, G33, G35, G36, W38, W43,W45)							
6/8/2011, 5:00-10:17	Breeding Bird Surveys and Point Counts (P48-P51, P54, P64, G31, G32,G34, W38, W43, W45)	P. Read	5hr 17min	14	n/a	fog	2	n/a
6/22/2011, 5:25-10:12	Breeding Bird Surveys and Point Counts (P48-P51, P54, P64, G31, G32,G34, W38, W43, W45)	A. Wormington	3hr 58min	18	100	light	2	n/a
7/8/2011, 6:25-7:58	Breeding Bird Surveys and Point Counts (P48-P51, P54, P64, G31, G32,G34, W38, W43, W45)	A. Wormington	4hr 43min	20	50	0	0	n/a
6/10/2011, 4:55-10:15	Breeding Bird Surveys and Point Counts (P57, P58, G37-G39, G43, W46, W47)	P. Read	5hr 20min	13	80	0	2	n/a
6/25/2011, 5:20-9:32	Breeding Bird Surveys and Point Counts (P57, P58, G37-G39, G43, W46, W47)	A. Wormington	5hr 24min	16	80	0	1	n/a
7/11/2011, 5:18-10:35	Breeding Bird Surveys and Point Counts (P57, P58, G37-G39, G43, W46, W47)	A. Wormington	2hr 32min	22	85	0	1	n/a
6/10/2011, 8:05-11:15	Breeding Bird Surveys and Point Counts (P59-P61, G40, G41, W22, W23, W44, M5)	P. Read	3hr 10min	16	100	0	2 to 3	n/a
6/26/2011, 6:10-9:30	Breeding Bird Surveys and Point Counts (P59-P61, G40, G41, W22, W23, W44, M5)	A. Wormington	2hr 44min	18	80	0	1	n/a
7/9/2011, 5:40-11:30	Breeding Bird Surveys and Point Counts (P59-P61, G40, G41, W22, W23, W44, M5)	A. Wormington	3hr 46min	20	0	0	1	n/a
6/1/2011, 5:00-10:24	Breeding Bird Surveys and Point Counts (P6, P17, P18, P25, P26, G4, G11, G42, W7-WW11, W20)	P. Read	5hr 24min	19	10	0	2	n/a
6/13/11, 5:40-11:30	Breeding Bird Surveys and Point Counts (P6, P17, P18, P25, P26, G4, G11, G42, W7-WW11, W20)	A. Wormington	5hr 55min	10	10	0	0	n/a
6/28/2011, 5:55-11:35	Breeding Bird Surveys and Point	A. Wormington	4hr 30min	20	100	0	2	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
	Counts (P6, P17, P18, P25, P26, G4, G11, G42, W7-WW11, W20)							
6/2/2011, 5:00-10:40	Breeding Bird Surveys and Point Counts (P7, P9, P13, P15, P16, G9, G12, W14, W15)	P. Read	5hr 40min	12	40	0	3	n/a
6/14/2011, 5:19-10:30	Breeding Bird Surveys and Point Counts (P7, P9, P13, P15, P16, G9, G12, W14, W15)	A. Wormington	4hr 9min	10	100	0	4	n/a
6/29/2011, 5:50-10:25	Breeding Bird Surveys and Point Counts (P7, P9, P13, P15, P16, G9, G12, W14, W15)	A. Wormington	3hr 31min	17	50	0	2	n/a
5/31/2011, 5:15-9:45	Breeding Bird Surveys and Point Counts (P8, P10-P12, G9,G10,W6, W15, M1, M2)	P. Read	4hr 30min	15	10	0	0	n/a
6/16/11, 5:18-10:35	Breeding Bird Surveys and Point Counts (P8, P10-P12, G9,G10,W6, W15, M1, M2)	A. Wormington	3hr 53min	10	0	0	1	n/a
7/2/2011, 5:55-10:25	Breeding Bird Surveys and Point Counts (P8, P10-P12, G9,G10,W6, W15, M1, M2)	A. Wormington	3hr 20min	16	0	0	1	n/a
5/31/2011	Henslow's Sparrow Breeding Nocturnal Survey	P.Read	unknown	16	10	0	2 W	4
5/30/2011	Henslow's Sparrow Breeding Nocturnal Survey	P.Read	unknown	17	10	0	0	4
6/3/2011	Henslow's Sparrow Breeding Nocturnal Survey	P.Read	unknown	12	40	0	1 SW	1
6/22/2011	Henslow's Sparrow Breeding Nocturnal Survey	A.Wormington	unknown	18	100	0	1 NE	4
6/14/2011	Henslow's Sparrow Breeding Nocturnal Survey	A.Wormington	unknown	13	0	0	0	2
30/05/11, 6:38-6:55	Least Bittern Callback Survey	P. Read	17min	16	80	0	1 NW	n/a
31/05/11, 7:40-7:55	Least Bittern Callback Survey	P. Read	15min	18	0	0	1 W	n/a
31/05/11, 5:40-5:55	Least Bittern Callback Survey	P. Read	15min	18	10	0	0	n/a
5/06/11, 8:55-8:08	Least Bittern Callback Survey	P. Read	13min	15	100	0	1 N	n/a
5/06/11, 6:20-6:33	Least Bittern Callback Survey	P. Read	13min	12	90	0	1 N	n/a
11/06/11, 5:30-5:46	Least Bittern Callback Survey	P. Read	16min	18	80	0	2-3 E	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
15/06/11, 05:55-06:10	Least Bittern Callback Survey	A.Wormington	15min	12	10	0	0	n/a
16/06/11, 06:15-06:40	Least Bittern Callback Survey	A.Wormington	25min	20	0	0	0	n/a
15/06/11, 08:25-08:42	Least Bittern Callback Survey	A.Wormington	17min	22	0	0	0	n/a
21/06/11, 05:40-06:05	Least Bittern Callback Survey	A.Wormington	25min	11	10	0	1 NE	n/a
21/06/11, 10:12-10:30	Least Bittern Callback Survey	A.Wormington	18min	22	10	0	1 SW	n/a
27/06/11, 05:47-06:10	Least Bittern Callback Survey	A.Wormington	23min	16	0	0	0	n/a
30/06/11, 05:35-05:55	Least Bittern Callback Survey	A.Wormington	20min	16	10	0	1 NW	n/a
2/07/11, 08:53-09:15	Least Bittern Callback Survey	A.Wormington	22min	20	0	0	1 S	n/a
2/07/11, 06:48-07:12	Least Bittern Callback Survey	A.Wormington	24min	18	0	0	1 SE	n/a
7/07/11, 05:59-06:25	Least Bittern Callback Survey	A.Wormington	26min	15	0	0	1 N	n/a
7/07/11, 10:02-10:21	Least Bittern Callback Survey	A.Wormington	19min	22	10	0	1 N	n/a
11/07/11, 06:07-06:26	Least Bittern Callback Survey	A.Wormington	19min	22	85	0	1	n/a
5/17/ 2011, 21:00-22:18	Eastern Whip-poor-will Call Survey	J.Heslop, B. Stamp	1hr18min	8	100	None/rain	2/NE	Full
5/18/ 2011, 22:51-22:57	Eastern Whip-poor-will Call Survey	J.Heslop, B. Stamp	56min	16	100	Mist/rain	1/E	Full
5/30/ 2011, 21:30-21:54	Eastern Whip-poor-will Call Survey	P. Read	24min	15	10	None/thunder storms	0	3/4
5/31/ 2011, 22:12-22:41	Eastern Whip-poor-will Call Survey	P.Read	29min	16	10	None/none	2/W	3/4
6/3/2011, 21:20-23:21	Eastern Whip-poor-will Call Survey	P.Read	2hr1min	12	40	None/none	1/SW	New
6/13/ 2011, 21:47-21:53	Eastern Whip-poor-will Call Survey	J.Heslop	6min	13	100	Mist/heavy rain	1/SE	3/4
6/16/2011, 21:25-22:47	Eastern Whip-poor-will Call Survey	A. Wormington	22min	20	75	Trace/none	0	Full
6/26/ 2011, 21:26-21:40	Eastern Whip-poor-will Call Survey	A. Wormington	14min	18	20	None/trace	0	1/3
6/27/ 2011, 22:03-22:09	Eastern Whip-poor-will Call Survey	A. Wormington	6min	18	50	None/none	0	1/10
Other Surveys (not targeting Species at Risk)								
4/19/2011, 19:45-22:00	Amphibian Surveys	B. Holden, J. Heslop	2hr 15min	7	100	0	3-4	n/a
4/20/2011, 20:00-21:30	Amphibian Surveys	B. Holden, J. Heslop	1hr 30min	3-4	100	Drizzle	6-7	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
4/26/2011, 20:25-21:58	Amphibian Surveys	D. Graham, M. Ross	1hr 23min	8	100	0	1	n/a
5/17/2011, 20:43-22:50	Amphibian Surveys	B. Stamp	2hr 7min	8	95	0	5	n/a
5/17/2011, 21:52-22:57	Amphibian Surveys	J. Heslop	1hr 5min	9	100	0	3	n/a
6/18/2011, 19:25-23:45	Amphibian Surveys	B. Holden, A. Wormington	4hr 20min	14	0	0	2-3	n/a
6/19/2011, 21:35-23.45	Amphibian Surveys	B. Holden, A. Wormington	2hr 10min	10	5	0	1	n/a
6/7/2011, 8:30-9:15	Waterfowl Nesting Survey (WN1)	P. Read	45min	13	40	0	1	n/a
6/5/2011, 9:25-9:40	Waterfowl Nesting Survey (WN2)	P. Read	15min	12	90	0	0	n/a
9/1/2011, 6:35 - 10:15	Fall Migratory landbird survey	B. Holden & A. Wormington	3hr 40min	18-22	100	0	1-4	n/a
9/2/2011, 6:41 - 9:44	Fall Migratory landbird survey	B. Holden & A. Wormington	3hr 3min	18-21	5-50	0	1-5	n/a
9/8/2011, 6:38 - 9:58	Fall Migratory landbird survey	B. Holden & A. Wormington	3hr 20min	16-18	80-100	0	1-5	n/a
9/9/2011, 6:35 - 9:38	Fall Migratory landbird survey	B. Holden & A. Wormington	3hr 3min	16-23	10-20	0	0-2	n/a
9/15/2011, 6:51 - 10:17	Fall Migratory landbird survey	B. Holden & M. Ross	3hr 26min	9-12	95-100	Light drizzle	2-3	n/a
9/16/2011, 7:20 - 10:43	Fall Migratory landbird survey	B. Holden & M. Ross	3hr 23min	4-10	0-15	0	3-4	n/a
9/22/2011, 7:06 - 9:50	Fall Migratory landbird survey	B. Holden &J. Mansell	2hr 44min	17-19	30-100	0	3	n/a
9/23/2011, 7:00 - 10:30	Fall Migratory landbird survey	B. Holden & J. Mansell	3hr 30min	14-20	10-100	0	1-3	n/a
9/29/2011, 7:10 - 10:25	Fall Migratory landbird survey	B. Holden & J. Mansell	3hr 15min	18	30-100	Light rain	0-1	n/a
9/30/2011, 7:13 - 10:18	Fall Migratory landbird survey	B. Holden &J. Mansell	3hr 5min	14-18	20-100	0	2-5	n/a
10/6/2011, 7:14 - 11:00	Fall Migratory landbird survey	B. Holden & J. Mansell	3hr 46min	2-16	0	0	0-3	n/a
10/7/2011, 7:30 -	Fall Migratory landbird survey	B. Holden & J.	2hr 45min	7-14	0	0	1-3	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
10:15		Mansell						
10/12/2011, 7:21 - 10:42	Fall Migratory landbird survey	B. Holden & Z. Lebrun-Southcott	3hr 21min	12-16	15-100	0	1-3	n/a
10/13/2011, 7:10 - 10:31	Fall Migratory landbird survey	B. Holden & Z. Lebrun-Southcott	3hr 21min	13-15	100	Light drizzle	1-4	n/a
10/20/2011, 7:14 - 10:40	Fall Migratory landbird survey	B. Holden & Z. Lebrun-Southcott	3hr 26min	10-13	90-100	Rain	4-6	n/a
10/21/2011, 7:20 - 10:19	Fall Migratory landbird survey	B. Holden & Z. Lebrun-Southcott	2hr 59min	8-11	80-100	0	2-4	n/a
9/1/2011, 16:00 -17:40	Fall Migratory Raptor Survey	B. Holden and A. Wormington	1hr 40min	25	50	0	1	n/a
9/8/2011, 16:30 -19:00	Fall Migratory Raptor Survey	B. Holden and A. Wormington	2hr 30min	20	50	0	2	n/a
9/15/2011, 13:30 - 16:30	Fall Migratory Raptor Survey	B. Holden and M. Ross	3hrs	17-19	40-80	0	3-4	n/a
9/22/2011, 13:20 - 18:26	Fall Migratory Raptor Survey	B. Holden and J. Mansell	5hr 6min	19-23	20-40	0	3	n/a
9/29/2011, 13:00 - 18:00	Fall Migratory Raptor Survey	B. Holden and J. Mansell	5hrs	19	80	0	2	n/a
10/6/2011, 12:00 - 15:10	Fall Migratory Raptor Survey	B. Holden and J. Mansell	3hr 10min	10	0	0	0-1	n/a
10/12/2011, 13:27 - 16:29	Fall Migratory Raptor Survey	B. Holden and Z. Lebrun-Southcott	3hr 2min	16	90	Scattered showers	1-2	n/a
10/20/2011, 13:47 - 17:02	Fall Migratory Raptor Survey	B. Holden and Z. Lebrun-Southcott	3hr 15min	14	90	0	3	n/a
10/27/2011, 12:03-16:25	Fall Migratory Raptor Survey	J. Mansell & Z. Lebrun-Southcott	4hr 22min	6	85	0	4	n/a
11/3/2011, 10:52-3:33	Fall Migratory Raptor Survey	J. Mansell & Z. Lebrun-Southcott	4hr 41min	5-10	20-90	0	3-4	n/a
11/9/2011, 12:15-16:20	Fall Migratory Raptor Survey	B. Stamp & J. Heslop	4hr 5min	15	30	0	2	n/a
11/9/2011, 8:06-8:11 & 13:18-15:52	Fall Migratory Raptor Survey	J. Mansell & Z. Lebrun-Southcott	2hr 39min	10-15	15-70	0	2-3	n/a
11/17/2011, 11:00-16:12	Fall Migratory Raptor Survey	J. Mansell & Z. Lebrun-Southcott	4hr 52min	2-4	50-75	Light flurries	3-4	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
11/24/2011, 8:55-13:00	Fall Migratory Raptor Survey	J. Heslop & Z. Lebrun-Southcott	4hr 5min	-1-5	30-100	0	2-3	n/a
12/1/2011, 11:58-16:40	Fall Migratory Raptor Survey	B. Holden & Z. Lebrun-Southcott	4hr 42min	6	40-60	0	1-2	n/a
9/1/2011, 16:00 -17:40	Fall Waterfowl Migration survey	B. Holden and A. Wormington	1hr 40min	25	50	0	1	n/a
9/8/2011, 16:30 -19:00	Fall Waterfowl Migration survey	B. Holden and A. Wormington	2hr 30min	n/a	n/a	n/a	n/a	n/a
9/15/2011, 13:30 - 16:30	Fall Waterfowl Migration survey	B. Holden and M. Ross	3hrs	17-19	40-80	0	4	n/a
9/22/2011, 13:00 - 18:30	Fall Waterfowl Migration survey	B. Holden and J. Mansell	5hr 30min	19-23	20-40	0	3	n/a
9/29/2011, 13:00 - 16:00	Fall Waterfowl Migration survey	B. Holden and J. Mansell	3hrs	19	70	0	2	n/a
10/6/2011, 12:00 - 15:10	Fall Waterfowl Migration survey	B. Holden and J. Mansell	3hr 10min	10-17	0	0	0-3	n/a
10/12/2011, 13:27 - 16:29	Fall Waterfowl Migration survey	B. Holden and Z. Lebrun-Southcott	3hr 2min	16	90	Scattered showers	1-2	n/a
10/20/2011, 13:47 - 17:02	Fall Waterfowl Migration survey	B. Holden and Z. Lebrun-Southcott	3hr 15min	14	90	0	3	n/a
10/27/2011, 12:03-16:25	Fall Waterfowl Migration survey	J. Mansell and Z. Lebrun-Southcott	4hr 22min	6	85	0	4	n/a
11/3/2011, 10:52-15:33	Fall Waterfowl Migration survey	J. Mansell and Z. Lebrun-Southcott	4hr 41min	5-10	20-100	0	3-4	n/a
11/9/2011, 13:08-15:49	Fall Waterfowl Migration survey	J. Mansell and Z. Lebrun-Southcott	2hr 41min	15	15	0	2	n/a
11/9/2011, 12:00-16:30	Fall Waterfowl Migration survey	B. Stamp and J. Heslop	4hr 30min	15	30	0	2	n/a
11/17/2011, 10:53-16:12	Fall Waterfowl Migration survey	J. Mansell and Z. Lebrun-Southcott	5hr 15min	2-4	50-75	Light flurries	3-4	n/a
11/24/2011, 8:55-13:00	Fall Waterfowl Migration survey	J. Heslop & Z. Lebrun-Southcott	4hr 5min	-1-5	30-100	0	2-3	n/a
12/1/2011, 11:59-16:40	Fall Waterfowl Migration survey	B. Holden & Z. Lebrun-Southcott	4hr 41min	6	60	0	1-2	n/a
12/7/2011, 9:50-12:20	Fall Waterfowl Migration survey	J. Mansell and Z. Lebrun-Southcott	2hr 30min	1	100	0	1-2	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
12/7/2011, 9:50-12:00	Fall Waterfowl Migration survey	C. Payette & B. Holden	2hr 10min	0	100	0	1	n/a
12/21/2011, 10:04-12:50	Fall Waterfowl Migration survey	C. Payette & Z. Lebrun-Southcott	2hr 46min	4	100	Light rain	3	n/a
12/21/2011, 10:00-14:00	Fall Waterfowl Migration survey	B. Holden & N. Charlton	4hrs	4-5	100	Rain	2	n/a
5/3/2011, 2:07-2:45; 4:15-7:47	Shorebird migration surveys	M. Ross and D. Graham	4hrs, 10min	8	100	0	3	n/a
5/11/2011, 3:21 –n/a	Shorebird migration surveys	B. Stamp and D. Graham	n/a	20	0	0	0	n/a
5/17/2011, 14:20-17:20	Shorebird migration surveys	B. Stamp and J. Heslop	3hrs	12	95	0	4	n/a
5/20/2011, 9:00-11:00	Shorebird migration surveys	A. Taylor, N. Kopysh	2hrs	15	100	0	0	n/a
5/25/2011, 11:35-2:59	Shorebird migration surveys	M. Ross and D. Graham	3hrs, 24min	20	5	0	3	n/a
5/26/2011, 9:24-10:30	Shorebird migration surveys	D. Graham	1hr, 6min	14	80	0	1-3	n/a
4/27/2011, 6:25 - 12:31	Spring Landbird Stopover surveys	M. Ross and D. Graham	6hrs 6min	6 - 8	100	0	1-3	n/a
4/28/2011, 7:04 - 7:21	Spring Landbird Stopover surveys	Don Graham	17min	10 - 15	5-10	0	3	n/a
5/4/2011, 6:00 - 12:53	Spring Landbird Stopover surveys	M. Ross and D. Graham	6hr 53min	8 - 15	10	0	0-2	n/a
5/11/2011, 6:10 - 10:45	Spring Landbird Stopover surveys	B. Stamp	4hr 35min	5- 18	60-100	0	2-4	n/a
5/12/2011, 6:06 - 12:28	Spring Landbird Stopover surveys	D. Graham	6hr 22min	12-21	10-100	0	1	n/a
5/18/2011, 6:25 - 14:50	Spring Landbird Stopover surveys	J. Heslop and B. Stamp	8hr 35min	14 - 16	80-100	Light rain	2-4	n/a
5/19/2011, 6:30 - 12:28	Spring Landbird Stopover surveys	J. Heslop and B. Stamp	5hr 58min	6- 8	100	0	0-2	n/a
5/26/2011, 6:20-2:40	Spring Landbird Stopover surveys	M. Ross and D. Graham	8hr 20min	10 - 15	5-10	0	1-2	n/a
3/24/2011, 12:00-15:20	Staging and Foraging Spring Waterfowl surveys	A. Taylor, N. Kopysh	3hr 20min	3	90	0	1	n/a
3/29/2011, 9:00-12:30	Staging and Foraging Spring	D. Graham, C.	3hr 30min	-1	70	0	2	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
	Waterfowl surveys	Karpijaakko						
4/4/2011, 11:30-14:30	Staging and Foraging Spring Waterfowl surveys	A. Taylor, N. Kopysh	3hr	5	100	0	3 to 4	n/a
4/24/2011, 12:40-16:30	Staging and Foraging Spring Waterfowl surveys	B. Stamp, J. Heslop	3hr 50min	10	60	0	2	n/a
4/19/2011, 11:20-2:30	Staging and Foraging Spring Waterfowl surveys	B. Holden, J. Heslop	3hr	9	50-90	0	3 to 4	n/a
4/26/2011, 14:45-18:00	Staging and Foraging Spring Waterfowl surveys	M. Ross, M. Strauss	3hr 15min	11	100	0	4	n/a
5/3/2011, 14:07-14:45 14:15-19:47	Staging and Foraging Spring Waterfowl surveys	M. Ross, D. Graham	4hr	8	100	Rain	3	n/a
5/11/2011, 15:31-18:08	Staging and Foraging Spring Waterfowl surveys	B. Stamp, D.Graham	2hr 37min	20	0	0	1	n/a
5/17/2011, 14:40-16:50	Staging and Foraging Spring Waterfowl surveys	B. Stamp, J. Heslop	2hr 10min	12	95	Light rain	4	n/a
5/25/2011, 11:35-14:59	Staging and Foraging Spring Waterfowl surveys	M. Ross, D. Graham	3hr 34min	20	5	0	3	n/a
7/8/2011, 12:30 - 16:15	Staging Swallow Survey	B. Holden	3hr 45min	26	30	0	0-1	n/a
7/13/2011, 11:30 - 15:00	Staging Swallow Survey	B. Holden	3hr 30min	22-26	50-100	0	2-6	n/a
7/23/2011, 11:00 - 14:40	Staging Swallow Survey	B. Holden	3hr 40min	32	10-30	0	2-3	n/a
7/27/2011, 8:40 - 12:00	Staging Swallow Survey	B. Holden	3hr 20min	27-29	40-60	0	3	n/a
8/3/2011, 12:00 - 15:00	Staging Swallow Survey	B. Holden	3hrs	20-23	100	0	2-3	n/a
8/9/2011, 14:00 - 16:00	Staging Swallow Survey	B. Holden	2hrs	19-21	100	Heavy rain	2-3	n/a
8/16/2011, 14:00 - 18:00	Staging Swallow and Migratory Butterfly Stopover Survey	M. Ross	4hrs	27	15-40	0	2	n/a
8/26/2011, 8:50 - 11:00	Staging Swallow and Migratory Butterfly Stopover Survey	M. Ross	2hr 10min	17-20	35t-45	0	3	n/a
9/2/2011, 11:15 -13:30	Staging Swallow Survey	B. Holden	2hr 15min	22-24	5	0	3-4	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
11/9/2011, 16:10-17:22	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Josh Mansell & Zoe Lebrun-Southcott	1hr 11min	8	85	0	3	n/a
11/9/2011, n/a	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Bob Stamp & Jim Heslop	n/a	12	90	0	3	n/a
11/24/2011, 15:47-17:11	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Jim Heslop & Zoe Lebrun-Southcott	1hr 36min	4	100	0	40972	n/a
11/24/2011,15:55-17:02	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Josh Mansell	1hr 7min	5	100	0	40972	n/a
12/7/2011, 8:50-9:05 & 9:50-12:20	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Josh Mansell & Zoe Lebrun-Southcott	2hr 45min	1	100	0	3	n/a
12/7/2011, 16:27-16:55	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Cheryl-Anne Payette	1hr 28min	0	100	0	2	n/a
12/20/2011, n/a	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Nicole Charlton	n/a	n/a	70-90	0	2-3	n/a
12/20/2011, 15:58-16:59	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Cheryl-Anne Payette & Zoe Lebrun-Southcott	1hr 1min	0	10-20	0	2	n/a
12/21/2011, 10:04-13:17	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	B. Holden & N. Charlton	3hrs13min	4	100	Light drizzle	2	n/a
12/21/2011, 10:04-12:49	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	C. Payette & Z. Lebrun-Southcott	2hr 45min	3	100	Light rain	3	n/a
1/10/2012, 10:00-11:45 &16:22-17:23	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Josh Mansell	2hr 46min	4	60	0	3	n/a
1/10/2012, 10:15-12:25 &16:30-17:20	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Don Graham & Matthew Ross	3hr	4	60	0	1	n/a
1/24/2012, 13:15-	Winter Raptor Driving and Walking	Don Graham &	3hr 12min	1	100	0	2	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
14:46 & 16:40-17:28	Transects, including Short-eared Owl Surveys	Matthew Ross						
1/24/2012, 13:10-15:05 & 16:20-17:37	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Josh Mansell	2hr 12min	1	100	0	3-4	n/a
2/7/2012, 10:52-12:58 & 16:58-17:54	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Don Graham & Carla Korpijaakko	3hr 2min	-2	100	0	1	n/a
2/7/2012, 10:55-13:26 & 16:45-17:44	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Josh Mansell & Brandon Holden	3hr 30min	1	0	0	1	n/a
2/22/2012, 10:50-12:15 & 17:00-17:55	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Don Graham & Carla Korpijaakko	2hr 20min	4	100	0	1	n/a
2/22/2012, 10:45-13:30 & 17:00-n/a	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Josh Mansell	2hr 45min	3	100	drizzle/snow/rain	5	n/a
3/7/2012, 10:50-12:25 & 17:15-18:27	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Brandon Holden & Josh Mansell	2hr 47min	8	55-90	0	3-4	n/a
3/7/2012, 14:35-17:35 & 17:35-18:30	Winter Raptor Driving and Walking Transects, including Short-eared Owl Surveys	Andrew Taylor and Nicole Kopysh	3hr 55min	8	30	0	3	n/a
6/9/2011, 20:20-20:40	Short-eared Owl Breeding Driving Survey	P. Read	20min	19	100	0	3	n/a
6/9/2011, 21:05-21:20	Short-eared Owl Breeding Driving Survey	P. Read	15min	19	100	0	3	n/a
6/10/2011, 20:00-21:15	Short-eared Owl Breeding Driving Survey	P. Read	1hr15min	18	100	0	3	n/a
6/11/2011, 20:00-21:15	Short-eared Owl Breeding Driving Survey	P. Read	1hr15min	19	100	Light	5	n/a
7/2/2011, 20:10-20:51	Short-eared Owl Breeding Driving Survey	A. Wormington	41min	23	40	0	0	n/a
7/3/2011, 20:12-21:08	Short-eared Owl Breeding Driving Survey	A. Wormington	56min	24	30	0	1	n/a
7/4/2011, 20:15-20:53	Short-eared Owl Breeding Driving	A. Wormington	38min	24	0	0	1	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
	Survey							
7/5/2011, 20:09-21:02	Short-eared Owl Breeding Driving Survey	A. Wormington	53min	23	70	0	1	n/a
7/6/2011, 20:22-21:10	Short-eared Owl Breeding Driving Survey	A. Wormington	48min	22	25	0	1	n/a
7/7/2011, 20:17-21:06	Short-eared Owl Breeding Driving Survey	A. Wormington	51min	22	50	0	0	n/a
7/8/2011, 20:19-21:07	Short-eared Owl Breeding Driving Survey	A. Wormington	48min	20	15	0	1	n/a
7/9/2011, 20:17-21:04	Short-eared Owl Breeding Driving Survey	A. Wormington	47min	18	30	0	1	n/a
6/7/2011, 20:30-20:50	Short-eared Owl Observational Survey (Station 4)	P. Read	20min	20	20	0	0	n/a
5/11/2011, 20:00-20:20	Short-eared Owl Observational Surveys (Station 1)	D. Graham	20min	10	20	0	1	n/a
6/6/2011, 20:50-21:10	Short-eared Owl Observational Surveys (Station 1)	P. Read	20min	17	<10	0	1	n/a
6/21/2011, 20:45-21:05	Short-eared Owl Observational Surveys (Station 1)	A. Wormington	20min	21	100	0	1	n/a
6/1/2011, 20:40-21:00	Short-eared Owl Observational Surveys (Station 10)	P. Read	20min	20	<10	0	3	n/a
6/15/2011, 20:26-20:46	Short-eared Owl Observational Surveys (Station 10)	A. Wormington	20min	22	10	0	0	n/a
5/11/2011, 20:00-20:20	Short-eared Owl Observational Surveys (Station 11)	B. Stamp	20min	15	20	0	2	n/a
5/30/2011, 20:55-21:15	Short-eared Owl Observational Surveys (Station 11)	P. Read	20min	16	10	0	0	n/a
6/26/2011, 20:34-20:54	Short-eared Owl Observational Surveys (Station 11)	A. Wormington	20min	18	35	0	1	n/a
5/11/2011, 20:26-20:46	Short-eared Owl Observational Surveys (Station 12)	B. Stamp	20min	15	20	0	2	n/a
5/30/2011, 20:20-20:40	Short-eared Owl Observational Surveys (Station 12)	P. Read	20 min	16	10	0	0	n/a
6/27/2011, 20:22-20:42	Short-eared Owl Observational Surveys (Station 12)	A. Wormington	20min	20	50	0	0	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
5/10/2011, 20:08-20:28	Short-eared Owl Observational Surveys (Station 13)	B. Stamp	20min	14	30	0	1	n/a
5/31/2011, 20:30-20:50	Short-eared Owl Observational Surveys (Station 13)	P. Read	20min	20	<10	0	2	n/a
6/27/2011, 20:46-21:06	Short-eared Owl Observational Surveys (Station 13)	A. Wormington	20min	20	50	0	0	n/a
5/10/2011, 20:32-20:52	Short-eared Owl Observational Surveys (Station 14)	B. Stamp	20min	10	10	0	3	n/a
6/9/2011, 20:40-21:00	Short-eared Owl Observational Surveys (Station 14)	P. Read	20min	19	100	0	3	n/a
6/22/2011, 20:17-20:37	Short-eared Owl Observational Surveys (Station 14)	A. Wormington	20min	20	100	0	1	n/a
5/31/2011, 20:55-21:15	Short-eared Owl Observational Surveys (Station 15)	P. Read	20min	22	<10	0	2	n/a
6/22/2011, 20:45-21:05	Short-eared Owl Observational Surveys (Station 15)	A. Wormington	20min	20	100	0	1	n/a
5/10/2011, 20:10-20:30	Short-eared Owl Observational Surveys (Station 2)	D. Graham	20min	10	20	0	1	n/a
6/6/2011, 20:30-20:50	Short-eared Owl Observational Surveys (Station 2)	P. Read	20min	17	<10	0	1	n/a
6/21/2011, 20:17-20:37	Short-eared Owl Observational Surveys (Station 2)	A. Wormington	20min	21	90	0	1	n/a
6/7/2011, 20:55-21:15	Short-eared Owl Observational Surveys (Station 3)	P. Read	20min	18	20	0	0	n/a
6/14/2011, 20:57-21:17	Short-eared Owl Observational Surveys (Station 3)	A. Wormington	20min	13	0	0	0	n/a
5/17/2011, 20:22-20:37	Short-eared Owl Observational Surveys (Station 4)	B. Stamp	15min	8	95	0	5	n/a
6/14/2011, 20:30-20:50	Short-eared Owl Observational Surveys (Station 4)	A. Wormington	20min	15	0	0	0	n/a
5/17/2011, 20:33-21:00	Short-eared Owl Observational Surveys (Station 5)	J. Heslop	27min	9	100	0	2-3	n/a
6/5/2011, 20:55-21:15	Short-eared Owl Observational Surveys (Station 5)	P. Read	20min	16	30	0	0	n/a
5/17/2011, 20:00-20:30	Short-eared Owl Observational Surveys (Station 6)	J. Heslop	30min	10	100	0	2-3	n/a

Table 3.1: Record of Amherst Island Field Surveys

Survey Date (mm/dd/yyyy) and time	Purpose of Site Investigation	Field Personnel	Duration (Person-Hours)	Weather Conditions*				
				Air (°C)*	Cloud (%)	Precip.	Wind**	Moon Phase
6/5/2011, 20:30-20:50	Short-eared Owl Observational Surveys (Station 6)	P. Read	20min	17	30	0	0	n/a
6/16/2011, 20:35-20:53	Short-eared Owl Observational Surveys (Station 6)	A. Wormington	18min	20	50	0	0	n/a
5/17/2011, 19:55-20:15	Short-eared Owl Observational Surveys (Station 7)	B. Stamp	20min	8	95	Light	5	n/a
6/1/2011, 21:05-21:25	Short-eared Owl Observational Surveys (Station 7)	P. Read	20min	18	<10	0	3	n/a
6/15/2011, 20:53-21:13	Short-eared Owl Observational Surveys (Station 7)	A. Wormington	20min	20	20	0	0	n/a
5/10/2011, 20:30-20:50	Short-eared Owl Observational Surveys (Station 8)	D. Graham	20min	10	20	0	1	n/a
6/3/2011, 20:50-21:10	Short-eared Owl Observational surveys (Station 8)	P. Read	20min	17	10	0	1	n/a
6/24/2011, 20:25-20:45	Short-eared Owl Observational Surveys (Station 8)	A. Wormington	20min	20	80	Light	1	n/a
5/11/2011, 20:27-20:47	Short-eared Owl Observational Surveys (Station 9)	D. Graham	20min	10	20	0	1	n/a
6/3/2011, 20:30-20:45	Short-eared Owl Observational Surveys (Station 9)	P. Read	15min	17	10	0	1	n/a
6/24/2011, 20:49-21:09	Short-eared Owl Observational Surveys (Station 9)	A. Wormington	20min	20	80	Trace	1	n/a
6/16/2011, 20:57-21:17	Short-eared Owl Observational Surveys Station 5)	A. Wormington	20min	18	60	0	0	n/a

Table 3.2: Summary of electrofishing effort, mussel survey effort and habitat characteristics; Amherst Island Wind – Stantec 2011					
Method	**Station**	**Substrate**	**Vegetation**	**Date**	**Effort (sec)**
Fish Collection					
Boat Electrofishing	**T1**	Sand and gravel	Sparse	7/12/2011	267
	T2	Sand, silt, cobble, gravel	Weedbed and emergent	7/12/2011	370
	T3	Bedrock	Sparse and weedbed	7/12/2011	297
	T4	Sand, cobble, silt and gravel	Sparse and weedbed	7/12/2011	315
	T5	Cobble, sand, silt and gravel	Emergent and weedbed	7/12/2011	364
	T6	Cobble, silt, gravel and sand	Emergent and weedbed	7/12/2011	330
	T7	Cobble, sand and gravel	Sparse	7/12/2011	440
	T8	Sand, gravel and cobble	Sparse and weedbed	7/12/2011	382
	T9	Cobble, sand, silt and gravel	Weedbed, sparse and overhanging terrestrial veg	7/12/2011	284
	T10	Sand, cobble, silt and gravel	Sparse and weedbed	7/12/2011	333
	T11	Cobble, sand and gravel	Sparse and weedbed	7/12/2011	329
	T12	Sand, gravel cobble	Weedbed	7/13/2011	-
	T13	Cobble, sand and gravel	Sparse and overhanging terrestrial veg	7/13/2011	259
	T14	Sand, gravel and cobble	Sparse and overhanging terrestrial veg	7/13/2011	646
	T15	Cobble, sand and gravel	Sparse and overhanging terrestrial veg	7/13/2011	364
	T16	Cobble	Sparse, algae and emergent	7/13/2011	505
Mussel Survey					
Mussel Survey	**Transect 18 (Mainland Central Dock)**	Sand (with gravel, cobble and boulder)	None observed at survey location	9/12/2011	8 hours
	Transect 013 (Mainland West Dock)	Sand	None observed	9/12/2011	
	Transect 014 (Mainland West Dock)	Boulders on sand	None observed	9/12/2011	
	Transect 008 (Island Dock)	Sand (with gravel and bedrock)	None observed	9/12/2011	
	Transect 009 Island Dock	Small cobble/gravel with sand	Patchy submergent	9/12/2011	
	Shell Search 026 (Island Dock)	n/a (shore area)	None	9/13/2011	6 hours

Table 3.3: Summary of Stantec fishing effort and habitat characteristics (minnow traps, seine nets, gillnets, fyke nets); Amherst Island Wind - 2011

Method	Location		Set Date/Time	Lift Date/Time	Effort	Substrate	Vegetation
Minnow Traps	Trap 1	a	July 4, 2011 16:50	July 5, 2011 08:30	15 hr 40 min	Gravel and cobble	n/a
		b					
		c					
	Trap 2	a	July 4, 2011 17:10	July 5, 2011 09:20	16 hr 10 min	Sand	n/a
		b					
	Trap 3	a	July 4, 2011 17:30	July 5, 2011 10:30	17 hr 00 min	Sand	Weedbed
		b					
		c					
	Trap 4	a	July 5, 2011 11:00	July 6, 2011 09:20	22 hr 40 min	Sand	Sparse
		b					
		c					
	Trap 5	a	July 5, 2011 12:30	July 6, 2011 09:23	20 hr 7 min	Clay	n/a
		b					
		c					
	Trap 6	a	July 5, 2011 12:49	July 6, 2011 09:40	20 hr 9 min	Sand	Sparse
		b					
	Trap 20		August 2, 2011 15:25	August 3, 2011 08:30	17 hr 5 min	Sand	Sparse
	Trap 21		August 2, 2011 15:35	August 3, 2011 08:36	17 hr 1 min	n/a	Sparse
	Trap 22		August 2, 2011 15:50	August 3, 2011 08:43	16 hr 53 min	Clay and sand	Sparse
	Trap 23		August 2, 2011 16:26	August 3, 2011 09:00	16 hr 44 min	Sand	Weedbed
	Trap 24		August 3, 2011 12:10	August 4, 2011 11:00	23 hr 50 min	Sand	n/a
	Trap 25		August 3, 2011 12:20	August 4, 2011 11:10	22 hr 50 min	Clay and sand	n/a
	Trap 26		August 3, 2011 12:25	August 4, 2011 12:15	23 hr 50 min	Clay and sand	n/a
	Trap 27		August 3, 2011 12:32	August 4, 2011 12:20	23 hr 48 min	Clay and sand	n/a
	Trap 28		August 4, 2011 14:40	August 5, 2011 09:15	18 hr 25 min	n/a	Sparse
	Trap 29		August 4, 2011 14:50	August 5, 2011 09:05	18 hr 15 min	Clay and sand	n/a
	Trap 30		August 4, 2011 15:00	August 5, 2011 09:09	14 hr 9 min	Sand	Weedbed
Gill Net	G1		Aug 2, 2011 14:10	Aug 2, 2011 17:20	3 hr 10 min	n/a	Sparse
	G2		Aug 2, 2011	Aug 2, 2011	3 hr 00 min	Clay and sand	n/a

Table 3.3: Summary of Stantec fishing effort and habitat characteristics (minnow traps, seine nets, gillnets, fyke nets); Amherst Island Wind - 2011						
Method	**Location**	**Set Date/Time**	**Lift Date/Time**	**Effort**	**Substrate**	**Vegetation**
		14:15	17:10			
	G3	Aug 3, 2011 11:45	Aug 3, 2011 14:10	2 hr 25 min	Sand	Sparse
	G4	Aug 3, 2011 12:00	Aug 3, 2011 14:00	2 hr 00 min	Sand	n/a
	G5	Aug 4, 2011 14:20	Aug 4, 2011 16:00	1 hr 40 min	Sand	Weedbed
	G6	Aug 4, 2011 14:30	Aug 4, 2011 16:20	1 hr 50 min	n/a	Weedbed
Fyke Net	**F1**	Aug 2, 2011 16:20	Aug 3, 2011 08:50	16 hr 30 min	Boulder	n/a
	F2	Aug 2, 2011 16:45	Aug 3, 2011 09:10	16 hr 25 min	Sand	Weedbed
	F3	Aug 3, 2011 12:45	Aug 4, 2011 11:30	23 hr 15 min	Sand and silt	Sparse
	F4	Aug 3, 2011 13:05	Aug 4, 2011 11:40	22 hr 25 min	Clay	n/a
	F5	Aug 4, 2011 14:15	Aug 5, 2011 08:55	18 hr 20 min	n/a	Weedbed
Seine Net	**S1**	Aug 3, 2011 14:45	Aug 3, 2011 14:50	5 min	Sand	Weedbed
	S2	Aug 3, 2011 14:45	Aug 3, 2011 14:50	5 min	Sand	Weedbed

Table 3.4: Species at Risk Survey Protocols and Methods

Species Surveyed	Detailed description of survey protocol/methodology used
Plants	
Butternut *Juglans cinerea*	Background data and records review, botanical inventory and ELC surveys on project location and associated 120 m investigation zones in 2011 and 2012 (where access permitted). Survey methods employed were consistent with MNR protocols. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Reptiles	
Eastern Musk Turtle *Sternotherus odoratus*	Habitat assessments were conducted based on data collected through the ELC and OWES surveys. Turtle overwintering substrate and habitat assessments were conducted during spring and summer in 2011. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Blanding's Turtle *Emydoidea blandingi*	Habitat assessments were conducted based on data collected through the ELC and OWES surveys. Turtle overwintering substrate and habitat assessments were conducted during spring and summer in 2011. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Birds	
Eastern Whip-poor-will *Caprimulgus vociferous*	Surveys for suitable habitat for Eastern Whip-poor-will were conducted on the project location and associated investigation zones during ELC surveys in 2011 and 2012. Nighttime point counts were conducted during the spring and summer of 2011. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Barn Swallow *Hirundo rustica*	Surveys for suitable habitat for Barn Swallow were conducted on the project location and associated investigation zones during ELC surveys in 2011 and 2012. Breeding bird surveys, including area searches and point counts, were conducted in 2011. Survey methodology protocols are based on the Ontario Breeding Bird Atlas. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Henslow's Sparrow *Ammodramus henslowii*	Surveys for suitable habitat were conducted in the Study Area by skilled birders. Breeding bird surveys, including area searches and point counts, were conducted in 2011. Supplemental nocturnal playback surveys specific to Henslow's Sparrow were also conducted in 2011. An assessment of microhabitat features required by Henslow's Sparrow was also conducted in 2011. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Bobolink *Dolichonyx oryzivorus*	Surveys for suitable grassland habitat for Bobolinks were conducted on the project location and associated investigation zones during ELC surveys in 2011 and 2012. Breeding bird surveys, including area searches and point counts, were conducted in 2011 with survey protocols based on the Ontario Breeding Bird Atlas. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Eastern Meadowlark *Sturnella magna*	Surveys for suitable grassland habitat for Bobolinks were conducted on the project location and associated investigation zones during ELC surveys in 2011 and 2012 (where access permitted). Breeding bird surveys, including area searches and point counts, were conducted in 2011 with survey protocols based on the Ontario Breeding Bird Atlas. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Mammals	
Little Brown Bat *Myotis lucifugus*	Habitat assessments were conducted on project location and associated investigation zones during ELC surveys (where access permitted). Bat maternity colony and hibernacula habitat assessments were conducted during spring and summer in 2011. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.

Table 3.4: Species at Risk Survey Protocols and Methods

Species Surveyed	Detailed description of survey protocol/methodology used
Northern Long-eared Bat *Myotis septentrionalis*	Habitat assessments were conducted on project location and associated investigation zones during ELC surveys (where access permitted). Bat maternity colony and hibernacula habitat assessments were conducted during spring and summer in 2011. See **Section 3.1** for a description of survey methods and **Table 3.1** for site investigation dates, field personnel, and weather condition information.
Aquatic	
Spotted Gar *Lepisosteus oculatus*	Fish community surveys did not target aquatic SAR
American Eel *Anguilla rostrata*	Fish community surveys did not target aquatic SAR
Eastern Pondmussel *Ligumia nasuta*	Preliminary survey from water surface for mussel occurrences; supplemented by shoreline shell searches, underwater photography, and substrate information. Survey method approved by Peterborough MNR prior to initiation.

Table 3.5: Amherst Island: Ecological Land Classification (ELC) Vegetation Types Overview	
ELC TYPE	**Community Description**
Forest (FO)	
Coniferous Forest (FOC)	
FOC2-1 Dry-Fresh Red Cedar Coniferous Forest	This young community was only observed on the mainland and was assessed from the roadside. Red cedar was the dominant canopy species with scattered occurrences of green ash. Understory species included canopy saplings, but largely consisted of grey dogwood. Ground cover included species such as goldenrods, asters, and common milkweed.
Deciduous Forest (FOD)	
FOD4-4* Dry-Fresh Ironwood Deciduous Forest	Only one of these community types was observed in the Study Area. The canopy was mid-age and consisted primarily of ironwood in association with green ash; ironwood was particularly abundant in the sub-canopy. Understory and ground cover species were sparse (i.e. <25% cover) but included wild red raspberry, lamb's quarters, Canada goldenrod, herb robert, and enchanter's nightshade. Based on this community's size, location, and composition, it has likely been subject to cattle grazing in the recent past.
FOD5 Dry-Fresh Sugar Maple Deciduous Forest	Access limitations prevented thorough assessments of these communities. Based on accessible sections or roadside assessments these communities often contained an abundance of sugar maple with admixtures of American basswood, and hickory, and ash. Understory and ground cover species observed may be more indicative of edge effect conditions and less reflective of their interiors as species often consisted of tatarian honeysuckle, common buckthorn, and garlic mustard.
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest	One of these community types was identified within the Study Area. This was a mature community dominated by sugar maple, with infrequent associations of red oak, and white birch. Understory species were typically limited to saplings and wild red raspberry, while ground cover often included woolly sweet-cicely, black snakeroot, stellate sedge, enchanter's nightshade, and herb-robert.
FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	These were mature communities with an abundance of sugar maple and varying abundances of American beech, and American basswood. Understory species consisted of canopy saplings with associations of choke cherry and prickly gooseberry, while ground cover commonly included jack-in-the-pulpit, enchanter's nightshade, woodland strawberry, and sedges.
FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	These were among the most commonly encountered community types, where canopy maturity varied from young to mature. Canopy species were occasionally dominated by green ash, but did included associations of white elm, slippery elm, and freeman's maple. The two most commonly observed shrubs in these communities were gray dogwood and narrow-leaved meadowsweet. Herbaceous species varied with soil moisture but often included scarlet strawberry, violets, white panicled aster, Canada goldenrod, Kentucky bluegrass, and fox sedge.
FOD9 Fresh-Moist Oak – Maple – Hickory Deciduous Forest	These communities were generally mid-age to mature with canopies inclusive of bur oak, green ash, shagbark hickory, and freeman's maple – varying in abundance. Understory composition included common buckthorn, and nannyberry, while ground cover often included white avens, woodland strawberry, hog peanut, violets, sedges, and wood reed grass.
FOD9-3 Fresh-Moist Bur Oak Deciduous Forest	These communities consistently included bur oak with frequent associations of green ash. Understory species often included saplings with fewer occurrences of nannyberry. Ground cover species often included sensitive fern, dwarf raspberry, hog peanut, white panicled aster, sedges and grasses.
FOD9-4 Fresh-Moist Shagbark Hickory Deciduous Forest	This community type was similar in composition to FOD9-3 but instead contained frequent occurrences of shagbark hickory in the canopy, with fewer occurrences of bur oak and green ash.
Cultural (CU)	
Cultural Plantation (CUP)	

Table 3.5: Amherst Island: Ecological Land Classification (ELC) Vegetation Types Overview	
ELC TYPE	**Community Description**
CUP3-12* White Spruce Coniferous Plantation	These were generally mid-age communities with a canopy cover of approximately 60-70% consisting predominantly of white spruce. Understory and ground cover species included primarily common buckthorn and reed canary grass with pockets of cultural meadow habitat. Assessments were completed remotely.
Cultural Meadow (CUM)	
CUM1-1 Old Field Mineral Cultural Meadow	Cultural meadow habitat typically consisted of inactive or infrequently used agricultural land that had a mix of forb and graminoid species. Species composition varied with soil moisture but most commonly included awnless brome, timothy, Kentucky blue-grass, Canada goldenrod, calico aster, wild carrot, common milkweed, bird's foot trefoil, tufted vetch, and scarlet strawberry. Admixtures of straw sedge, bebb's sedge, red-top grass, and reed-canary grass were often observed where soil had higher moisture content.
Cultural Thicket (CUT)	
CUT1-4 Gray Dogwood Cultural Thicket	This was the most commonly observed cultural thicket community. Tree cover was sparse but commonly included green ash and white elm. Gray dogwood was abundant to dominant with less common admixtures of narrow-leaved meadowsweet. Ground cover varied but consistently included Kentucky bluegrass, Canada bluegrass, timothy, red-top grass, wild carrot, scarlet strawberry, flat-topped bushy goldenrod, Canada goldenrod, common heal-all, and path rush.
CUT1-7* Prickly Ash Cultural Thicket	This community type contained an abundance of prickly ash, with fewer associations of gray dogwood and Eastern red cedar. Ground cover typically included wild carrot, black medic, tufted vetch, timothy, and Canada bluegrass.
CUT1-8* Meadowsweet Cultural Thicket	Narrow-leaved meadowsweet sweet typically dominated these communities, which were often associated with varying degrees of livestock disturbance. Sparse tree cover included green ash, bur oak, and white elm, while ground cover generally included path rush, straw sedge, red-top grass, bluegrass, giant goldenrod, and flat-topped bushy goldenrod.
CUT1-9* Willow Cultural Thicket	Only one of these communities was observed, which occurred at a higher elevation than the surrounding terrain. Long-beaked willow, although normally found in wetland habitat was the dominant shrub with few associations of gray dogwood and red-osier dogwood. Ground cover most commonly consisted of timothy grass, with associations of awnless brome, red-top grass, wild red raspberry, wild carrot, bull thistle, and curly-leaf dock. No evidence of surface water accumulation was observed, and soil appeared to be dry to fresh. This community was moderately grazed by cattle.
Cultural Savannah (CUS)	
CUS1-1 Hawthorn Cultural Savannah	Only one of these communities was observed, consisting of approximately 25-30% cover of predominantly hawthorn species. Confirmation of hawthorn species could not be determined due to property access constraints. Ground cover species included wild carrot, bird's foot trefoil, blueweed, and awnless brome.
Cultural Woodland (CUW)	
CUW1-1 Red Cedar Cultural Woodland	This community, assessed remotely contained primarily mid-age red cedar scattered throughout. Understory species included patchy occurrences of prickly ash, lilac, and gray dogwood, while the herbaceous layer was composed largely of species consistent with dry cultural meadow communities.
CUW1-3* Mixed Cultural Woodland	These young to mid-age communities contained a mix of canopy species, including eastern red cedar, green ash, sugar maple, and American basswood. Understory species included prickly ash, gray dogwood, and less commonly lilac. Ground cover generally consisted of species consistent with dry cultural meadow communities.
CUW1-4* Sugar Maple Cultural Woodland	While this community contained a canopy cover adequate for "forest" classification, it did not have a typical forest structure as it was heavily grazed by cattle. Canopy species included sugar maple, with infrequent occurrences of shagbark hickory and ash. No shrub species were observed, and the herbaceous layer, where identifiable, consisted of common dandelion, common burdock, and common motherwort.

Table 3.5: Amherst Island: Ecological Land Classification (ELC) Vegetation Types Overview	
ELC TYPE	**Community Description**
CUW1-5* Green Ash Cultural Woodland	These communities were typically young to mid-age and either associated with open canopies or heavy livestock grazing. Understory and ground cover species varied in abundance in density but generally included gray dogwood, prickly ash, common buckthorn, wild red raspberry, enchanter's nightshade, scarlet strawberry, avens, and Canada goldenrod. Soil generally had a moisture regime of 4-5.
CUW1-6* Sugar Maple – White Pine Cultural Woodland	While not actively grazed, this mature community was split by mowed paths up to 4m wide. Canopy species included sugar maple, white birch, and white pine with an understory often dense with choke cherry. Ground cover was often limited in extent by wild red raspberry, but included enchanter's nightshade, common dandelion, common burdock, with fewer occurrences of herb-robert and common heal-all.
CUW1-7* Black Locust Cultural Woodland	Black locust was the dominant species in this canopy, with fewer occurrences of green ash. Understory species often included tatarian honeysuckle, lilac, and wild red raspberry, while ground cover was composed of species consistent with cultural meadow communities. The north half of this community occurred alongside residential property, while the south half was situated within active pasture land.
Swamp (SW)	
Deciduous Swamp (SWD)	
SWD1-2 Bur Oak Mineral Deciduous Swamp	This community consisted of a dense, mature canopy made up of green ash, bur oak, and Freeman's maple, with fewer occurrences of shagbark hickory and trembling aspen. The subcanopy also consisted of green ash and bur oak, but black ash and slippery elm were also common. Nannyberry, shagbark hickory, bur oak, and blue beech formed a thick understory, and the ground layer was dominated by sensitive fern along with dwarf raspberry, sedges, American hog-peanut, and fowl meadow grass.
SWD2-2 Green Ash Mineral Deciduous Swamp	These communities generally ranged from mid-age to mature stands with fairly thick canopy and ground layers, and patchy understories. The dominant canopy species was typically green ash, followed by lower abundances of Freeman's maple, and occasionally white elm. Typical understory species ranged through silky dogwood, narrow-leaved meadowsweet, and nannyberry, while the ground layers consisted mainly of fowl meadow grass, fox sedge and other sedges, Northern water-horehound, panicled aster, and Virginia wild rye. Soil was moist throughout, with some surface pools of no more than 10 to 15cm depth in the wettest communities.
SWD3-3 Swamp Maple Mineral Deciduous Swamp	These mature communities generally consisted of canopies dominated by Freeman's maple and green ash; American basswood was an occasional to rare occurrence among them. The subcanopy composition typically included canopy species as well as blue beech and elm species. Shrub species were infrequent and varied between communities but included gray dogwood, narrow-leaved meadowsweet, winterberry, and red-osier dogwood. The ground layers were dense and consisted mainly of sedges, spotted touch-me-not, fowl meadow grass, sensitive fern, wood nettle, jack-in-the-pulpit, and panicled aster.
Thicket Swamp (SWT)	
SWT2-2 Willow Mineral Thicket Swamp	This community consisted of a dense canopy of slender willow with infrequent occurrences of green ash. The understory was a moderately thick layer of narrow-leaved meadowsweet, while the ground layer included redtop grass, fox sedge, timothy grass, and daisy fleabane. This community type was generally associated with or adjacent to culturally influenced habitat.
SWT2-6 Meadowsweet Mineral Thicket Swamp	These communities consisted of thick canopies of narrow-leaved meadowsweet above ground layers consisting primarily of reed-canary grass and grass-leaved goldenrod. Other less frequently observed species included swamp milkweed, sedges, and bulrushes.
SWT2-9 Gray Dogwood Mineral Thicket Swamp	This mid-age community was dominated by a dense understory layer of gray dogwood with scattered occurrences of narrow-leaved meadowsweet. Rare to occasional occurrences of green ash, Freeman's maple, and white elm made up a sparse canopy. The ground layer was thick and dominated by reed-canary grass, giant goldenrod, wild

Table 3.5: Amherst Island: Ecological Land Classification (ELC) Vegetation Types Overview	
ELC TYPE	**Community Description**
	carrot, and an aster species.
Marsh (MA)	
Meadow Marsh (MAM)	
MAM2-2 Reed-canary Grass Mineral Meadow Marsh	These communities generally consisted of a thick layer of reed-canary grass accompanied by varying mixtures of less commonly observed species such as wool-grass, sedges, grass-leaved goldenrod, swamp milkweed, and hedge bindweed. Woody species were rare occurrences and consisted primarily of green ash, gray dogwood, and narrow-leaved meadowsweet.
MAM2-5 Narrow-leaved Sedge Mineral Meadow Marsh	This young community consisted of a ground layer of herbaceous species with obvious evidence of livestock grazing. The most abundant species were woolly sedge, redtop, path rush, blue vervain, Canada goldenrod, American water-horehound, heal-all, grass-leaved goldenrod, fox sedge, and ragweed. The community contained very small and shallow pockets of surface water as well as a natural drainage channel.
Shallow Marsh (MAS)	
MAS2-2 Bulrush Mineral Shallow Marsh	This mid-age community consisted of a thick ground layer dominated by wool-grass and containing occasional occurrences of path rush, soft rush, grass-leaved goldenrod, and a sedge species. There was no evidence of surface water at the time of the survey.
MAS2-10* Sweet Manna Grass Shallow Marsh	This mid-age community was dominated by a thick ground layer of sweet manna grass. Green ash formed a very sparse canopy layer along with rare occurrences of Freeman's maple and bur oak. Snags were abundant throughout and some surface water was present.
MAS3-1 Cattail Organic Shallow Marsh	This community was dominated by a ground layer consisting entirely of cattail, and was part of a PSW for which no property access was available.

Table 3.6: Eastern Whip-poor-will Calling Occurrences during Whip-poor-will Ground Singing Surveys (2011)*

Station	Round 1	Round 2	Round 3
1	0	0	0
2	1 Eastern Whip-poor-will, within 100m to the SE	0	0
3	0	2 Eastern Whip-poor-will observed to the NE outside 100m	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	1 Eastern Whip-poor-will observed outside 100m to the NE	0
10	0	1 Eastern Whip-poor-will observed in SE within 100m	2 Eastern Whip-poor-will heard to E approx. 250m apart, both outside 100m

*note given the distance Eastern Whip-poor-will can be heard calling it is likely some of these records are of the same individual, therefore the numbers do not indicate total number of individual Eastern Whip-poor-wills

Table 3.7: Summary of Henslow's Sparrow Site Investigation Results

Survey Station	Project Components within 500 m of Survey Locations	ELC Community	Habitat Description	Assessed Potential for Breeding Habitat	Playback Survey Results May 30, 2010	Playback Survey Results June 22, 2010
1	None	AG – Hay AG - Pasture	Rare standing dead residual vegetation; 20 shrubs/ha; 5 trees/ha; flat topography	Low due to shrub/tree growth and lack of wet areas.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
2	Wind Turbine	AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; gently rolling topography	Low due to rolling topography and active hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
3	None	CUM1-1	Rare standing dead residual vegetation; no shrubs; 1 tree/ha; low topography with ditch	Moderate due to low topography with potential wet areas and lack of shrub/tree cover. Fallow field provides tall vegetation cover.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
4	Access Road Underground Collector Line Wind Turbine	AG – Hay AG – Pasture AG - Fallow	Common standing dead residual vegetation; 15 shrubs/ha; no trees; flat topography	Low due to shrub/tree growth and lack of wet areas. Actively managed for hay.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
5	Access Road Underground Collector Line	CUM1-1 AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; low topography	Moderate due to low topography with potential wet areas and lack of shrub/tree cover.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
6	Underground Collector Line Access Road	AG – Hay AG - Pasture	Rare standing dead residual vegetation; no shrubs; 6 trees/ha; gently sloping topography	Low due to sloping topography and some encroachment of shrub/tree cover. Actively managed for hay.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
7	MET Tower Access Road Underground Collector Line Wind Turbine	AG - Hay	Rare standing dead residual vegetation; 5 shrubs/ha; no trees; flat topography	Low due to sloping topography and some encroachment of shrub/tree cover. Actively managed for hay.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
8	None	AG – Hay AG - Pasture	Rare standing dead residual vegetation; no shrubs; no trees; low and flat topography	Low due to flat topography and active hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
9	None	AG - Pasture	Rare standing dead residual vegetation; no shrubs; no trees; low	Moderate due to low topography with potential wet areas and lack of	No Henslow's Sparrow	No Henslow's Sparrow

Table 3.7: Summary of Henslow's Sparrow Site Investigation Results

Survey Station	Project Components within 500 m of Survey Locations	ELC Community	Habitat Description	Assessed Potential for Breeding Habitat	Playback Survey Results May 30, 2010	Playback Survey Results June 22, 2010
			flat topography	shrub/tree cover.	observed	observed
10	Access Road Underground Collector Line Wind Turbine MET Tower	AG – Fallow AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; flat topography with some low spots	Moderate due to flat topography with low spots and lack of shrub/tree cover.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
11	None	AG - Pasture	Rare standing dead residual vegetation; no shrubs; no trees; low and flat topography	Moderate due to low topography with potential wet areas and lack of shrub/tree cover.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
12	Access Road Overhead Transmission Line	AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; flat topography	Low due to flat topography and active hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
13	Operation and Maintenance Building Access Road Underground Collector Line	AG – Hay AG – Pasture	Rare standing dead residual vegetation; no shrubs; no trees	Low due to actively managed hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
14	Underground Collector Line	AG – Pasture	Rare standing dead residual vegetation; 20-30 shrubs/ha; <1 trees/ha; rolling topography	Low due to shrub/tree growth and lack of wet areas.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
15	Wind Turbine Access Road Underground Collector Line	AG – Pasture	No standing dead residual vegetation; no shrubs; no trees; flat topography with small dips	Moderate due to low topography with potential wet areas and lack of shrub/tree cover.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
16	Underground Collector Line Access Road	AG – Pasture CUM1-1	Rare standing dead residual vegetation; 30 shrubs/ha; 3 trees/ha; flat topography with ditch and some moist areas for grasses	Low due to shrub/tree growth and lack of wet areas.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
17	Access Road	CUM1-1	Rare standing dead residual	Moderate due to low topography	No Henslow's Sparrow	No Henslow's Sparrow

Table 3.7: Summary of Henslow's Sparrow Site Investigation Results

Survey Station	Project Components within 500 m of Survey Locations	ELC Community	Habitat Description	Assessed Potential for Breeding Habitat	Playback Survey Results May 30, 2010	Playback Survey Results June 22, 2010
			vegetation; no shrubs; no trees; low and flat topography	with potential wet areas and lack of shrub/tree cover.	observed	observed
18	None	AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; low, rolling topography	Low due to rolling topography and active hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
19	Access Road	AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; rolling topography with low ditch; residential property near narrow grassland habitat	Low due to rolling topography and active hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed
20	Access Road Underground Collector Line	AG - Hay	Rare standing dead residual vegetation; no shrubs; no trees; low, rolling topography with some sloping	Low due to rolling topography and active hay field.	No Henslow's Sparrow observed	No Henslow's Sparrow observed

Table 3.8: Summary of Potential Grassland Habitat within the Amherst Island Wind Energy Project Location

Habitat Feature number	Habitat type	Size of contiguous habitat patch (ha)	Project components requiring habitat removal	Long-term (permanent) habitat removal (ha)	Percent of habitat patch to be removed for Project (long-term)	Temporary* habitat to be removed (ha)	Total area to be removed for all infringements (temporary and long-term)	Percent area to be removed for total infringements (temporary and long-term)
1	CUM1-1 (old field mineral cultural meadow) Agriculture- Hay Agriculture - Pasture Fallow	105	• Access road • T10 base • T10 construction area • T17 base • T17 construction area • Collector line	0.75	0.71%	3.5	4.25	4.05%
2	CUM1-1 (old field mineral cultural meadow) Agriculture – Hay Agriculture – Pasture	912.8	• Access road(s) • T09, 03, 11, 25, 35, 23, 16, 5, 34, 08 and 32 base and construction areas • T20 access • Operations and Maintenance Building • Collector line	7.24	0.79%	24.2	31.44	3.44%
3	CUM1-1 (old field mineral cultural meadow) CUT1-4 Gray dogwood cultural thicket) Agriculture- Hay Agriculture - Pasture	492.8	• Access road(s) • T01, 29, 04, 22, 31 base and Construction areas • Collector line	1.98	0.4%	8.85	10.83	2.2%
4	CUM1-1 (old field mineral cultural meadow) Agriculture- Hay Agriculture - Corn	160.5	• Access road(s) • T06 base and construction area • Collector line • Island transmission line • Collector line • Operations and Maintenance Building • Batch plan • Central staging area	1.17	0.73%	5.75	6.92	4.31%
5	Agriculture – Hay Agriculture - Pasture	208.16	• Access road(s) • T36 and 19 base and construction area • T21 access road • Collector line	0.99	0.48%	3.86	4.85	2.33%
6	Agriculture – Hay Agriculture - Alfalfa	238.16	• Access road(s) • T07, 14, 02, 27, 37 base and construction area • Collector line	2.15	0.90%	8.68	10.83	4.55%
7	Agriculture – Hay Agriculture - Pasture	465.21	• Operations and Maintenance Building • Access road(s) • T15, 30, 26, 18, 13 base and construction area • Collector line	1.49	0.32%	7.99	9.48	2.04%
8	Agriculture – Hay Agriculture - Pasture	418.56	• Operations and Maintenance Building • Access road(s) • T12, 28, 33 base and construction area • Collector line	1.42	0.34%	5.02	6.44	1.54%

Table 3.8: Summary of Potential Grassland Habitat within the Amherst Island Wind Energy Project Location

Habitat Feature number	Habitat type	Size of contiguous habitat patch (ha)	Project components requiring habitat removal	Long-term (permanent) habitat removal (ha)	Percent of habitat patch to be removed for Project (long-term)	Temporary* habitat to be removed (ha)	Total area to be removed for all infringements (temporary and long-term)	Percent area to be removed for total infringements (temporary and long-term)
9	CUM1-1 (old field mineral cultural meadow) Marsh Agriculture – Pasture	111.87	None	0	0.00%	0	0	0.00%
10	CUM1-1 (old field meadow)	14.57	None	0	0.00%	0	0	0.00%
11	CUM1-1 (old field meadow)	20.02	None	0	0.00%	0	0	0.00%
12	CUM1-1 (old field meadow)	11.08	None	0	0.00%	0	0	0.00%
13	Agriculture - Hay	9.89	• Central Staging Area • Potential Switching Station • Collector line	0.25	2.53%	8.93	9.18	92.82%
14	CUM1-1 (old field meadow)	19	None	0	0.00%	0	0	0.00%
Total		**3187.62**		**17.44**	**0.55%**	**76.78**	**94.22**	**2.95%**

*Temporary habitat is defined as the constructible areas of the project: i.e. laydown areas, truck turn-around areas, etc. These are all considered temporary because these areas will be rehabilitated once the construction is complete.

Table 3.9: Grassland Bird Observations

Survey Station Number	ELC Classification	Species Observations (max # recorded)		
		Bobolink	Eastern Meadowlark	Barn Swallow
BB4	*Not classified under ELC, although likely AG - Hay or Pasture	4	4	0
BB6	*Not classified under ELC, although likely AG - Hay or Pasture	2	1	0
BB7	AG - hay	4	2	0
BB9	AG – PAS/CUM1-1	4	2	0
BB10	*Not classified under ELC, although likely AG - Hay or Pasture	0	1	1
BB15	AG - Pasture	5	3	0
BB16	AG - pasture	12	0	0
BB17	AG – hay/pasture	5	2	0
BB18	AG - hay	3	0	0
BB20	AG - pasture	4	0	0
BB21	AG - pasture	5	0	0
BB22	AG - pasture	4	0	0
BB23	AG - pasture	2	1	0
BB24	AG - hay	14	0	0
BB25	AG - hay	8	1	0
BB26	AG - hay	1	0	0
BB27	AG - hay	4	1	0
BB29	AG - hay	5	0	0
BB30	CUM1-1	3	0	0
BB31	AG - hay	4	1	0
BB33	AG - pasture	2	0	0
BB34	*Not classified under ELC, although likely AG - Hay or Pasture	9	0	0
BB35	AG - hay	8	1	0
BB36	AG - pasture	5	1	0
BB37	AG - pasture	6	0	0
BB38	AG - hay	6	0	0
BB39	AG - hay	8	0	0
BB41	CUM1-1	1	0	0
BB42	AG - hay	5	2	0
BB43	AG - hay	5	0	0
BB44	AG - hay	9	2	0
BB45	AG - hay	10	1	0
BB48	AG - hay	8	0	0
BB49	AG - hay	5	0	0
BB51	AG - Alfalfa	6	0	0
BB53	AG - Pasture	1	0	0
BB54	AG - Pasture	3	0	0
BB55	*Not classified under ELC, although likely AG - Hay or Pasture	9	0	0

Table 3.9: Grassland Bird Observations

Survey Station Number	ELC Classification	Species Observations (max # recorded)		
		Bobolink	Eastern Meadowlark	Barn Swallow
BB57	AG - Pasture	12	0	0
BB59	*Not classified under ELC, although likely AG - Hay or Pasture	12	2	6
BB60	AG - Pasture	7	0	0
BB61	Marsh *Not classified under ELC	1	0	0

Table 3.10: Fish community data from the MNR's 2009 survey (LOMU) for stations within the Amherst Island Project Study Area

	Station/Date							
	40	48	51	57	58	60	63	
Species	11-Aug	7-Aug	7-Aug	11-Aug	11-Aug	11-Aug	12-Aug	Total
Yellow Perch		1	17	1				19
Bluntnose Minnow								0
Spottail Shiner								0
Rock Bass			6	32			1	39
Round Goby								0
Bluegill								0
Blackchin Shiner								0
Banded Killifish								0
Common Carp								0
Freshwater Drum	4				1			5
Brown Bullhead	1			11		2		14
Smallmouth Bass	3	1		4				8
White Sucker	3	3	1			4	3	14
Chinook YOY								0
Largemouth Bass	1							1
Bowfin			1		1			2
Northern Pike					1			2
Silver Redhorse					1			1
Channel Catfish						2		2
Pumpkinseed					1			1
Walleye			2					3

Table 3.11: Results of Stantec's electrofishing survey – July 12 and 13, 2011 (Amherst Island Wind Energy Project)

Species	Station																Total
	T1	T2*	T3*	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	
Yellow Perch	1		5	3	2	6	2	8	2	3	1				2	2	37
Bluntnose Minnow	2	2	1				1									5	11
Spottail Shiner	3		2														5
Rock Bass	8	3	1		2		2	2	1		1			2		1	23
Round Goby	16	3	2	2	2	1	3	5	6		7	8	7	5	1	2	70
Bluegill	4							2							1	7	14
Blackchin Shiner	2									1							3
Banded Killifish	1			2													3
Common Carp		1	10														11
Freshwater Drum				2			1						1				4
Brown Bullhead						2		1									3
Smallmouth Bass								2								1	3
White Sucker									1								1
Chinook YOY														2			2
Largemouth Bass																3	3
Total	**37**	**9**	**21**	**9**	**6**	**9**	**9**	**20**	**10**	**4**	**9**	**8**	**8**	**9**	**4**	**21**	

* near location of Island dock

Table 3.12: Results of minnow trap sets – Stantec, July and August 2011 (Amherst Island Wind Energy Project)

Location	MT1			MT2		MT3*			MT4			MT5			MT6		MT 20*	MT 21*	MT 22	MT 23	MT 24	MT 25	MT 26	MT 27	MT 28*	MT 29*	MT 30*	Total
	a	b	c	a	b	a	b	c	a	b	c	a	b	c	a	b												
Round Goby	12	30	12	3	no catch	12	no catch			3				2	8	14	55	62	72	15	31	28	42	36	25	60	19	541
Yellow Perch						4		2	2	1	3								1				1					14
Pumpkinseed									3		7					2												12
Rock Bass												2	1										1		1			5
Total	**12**	**30**	**12**	**3**		**16**		**2**	**5**	**4**	**10**	**2**	**1**	**2**	**8**	**16**	**55**	**62**	**73**	**15**	**31**	**28**	**44**	**36**	**26**	**60**	**19**	

***** East of Coco Paving pier (vicinity of East Dock Option)

Table 3.13: Results of Gill Nets, Fyke Nets and Seine Netting – Stantec, August 2011 (Amherst Island Wind Energy Project)

Method	Gill Net						Fyke Net					Seine Net		Total
Station	**G1***	**G2***	**G3**	**G4**	**G5**	**G6**	**F1**	**F2**	**F3**	**F4**	**F5**	**S1**	**S2**	
Rock Bass	No Catch	No Catch	No Catch	No Catch		No Catch	No Catch			2	2		No Catch	**4**
Round Goby									2	2		1		**5**
Freshwater Drum					1									**1**
Largemouth Bass								1						**1**
Total	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**2**	**4**	**2**	**1**	**-**	**11**

***** East of Coco Paving pier (vicinity of East Dock Option)

Table 3.14: Summary of Substrate and Vegetation at Proposed Dock Locations (Amherst Island Wind Energy Project)

	Substrate	Vegetation
Amherst Island:	Cobble	Scattered/Sparse Submergent Vegetation
Mainland Central	Cobble/Sand	Scattered/Sparse Submergent Vegetation
Mainland East	Sand	Milfoil and Scattered/Sparse Submergent Vegetation
Mainland West	Sand	none

Table 3.15: Summary of Protected Species and Habitat

Species Name	Evidence that species is on and/or surrounding proposed location?	Evidence that species' habitat is on and/or surrounding proposed location?	Species Classification (provided in SARO List)	Is species' habitat currently protected under Section 10 of ESA?[1]
Plants				
Butternut *Juglans cinerea*	**Two** observed during specific floristic inventories **outside** of the Project Location; located more than 200m from construction activities.	n/a	☒Endangered ☐Threatened	☒No ☐Yes, habitat protected via habitat regulation ☐Yes, general habitat is protected
Reptiles				
Eastern Musk Turtle *Sternotherus odoratus*	**None** observed during reptile and all inventories.	Potential habitat found in proximity to Project Location and vicinity (Long Point Marsh).	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Blanding's Turtle *Emydoidea blandingi*	None observed during reptile and all inventories. However, likely to be present in coastal marshes.	Potential habitat found in proximity to Project Location and vicinity (Long Point Marsh).	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Birds				
Peregrine Falcon *Falco peregrinus*	Species was observed as per field study results but restricted to migration window.	**No** breeding or nesting habitat.	☐Endangered ☒Threatened	☐No ☒Yes, habitat protected via habitat regulation ☐Yes, general habitat is protected
Eastern Whip-poor-will *Caprimulgus vociferous*	Species is **present** as per field study results. Locations of observations are illustrated on **Figures 3.0-3.8**	Habitat is **found** within the Project Study Area and is illustrated on **Figures 3.0-3.8**	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Least Bittern *Ixobrychus exilis*	**One** observed during field investigations **outside** the Project Location; located over 500m from any component.	No suitable habitat occurred in Project Location or local vicinity.	☐Endangered ☒Threatened	☒No ☐Yes, habitat protected via habitat regulation ☐Yes, general habitat is protected

Table 3.15: Summary of Protected Species and Habitat

Species Name	Evidence that species is on and/or surrounding proposed location?	Evidence that species' habitat is on and/or surrounding proposed location?	Species Classification (provided in SARO List)	Is species' habitat currently protected under Section 10 of ESA?[1]
Barn Swallow *Hirundo rustica*	Species observed foraging during field investigations. Locations illustrated on **Figures 4.0-4.5.**	Foraging habitat is present in the Project Area. **No** anthropogenic structures being removed and all structures are setback from turbines.	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Henslow's Sparrow *Ammodramus henslowii*	**None** observed during field investigations.	Limited habitat of low to moderate suitability occurred within the Project Area.	☒Endangered ☐Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Eastern Meadowlark *Sturnella magna*	Species is **present** as per field study results. Locations are illustrated on **Figures 4.0-4.8.**	Habitat is **found** within the Project Study Area and is illustrated on **Figures 4.0-4.8.**	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Bobolink *Dolichonyx oryzivorus*	Species is **present** as per field study results. Locations are illustrated on **Figures 4.0-4.8.**	Habitat is **found** within the Project Study Area and is illustrated on **Figures 4.0-4.8.**	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Mammals				
Little Brown Bat *Myotis lucifugus*	**None** observed during field investigations.	No suitable habitat maternity colony or hibernacula habitat occurred in Project Location or local vicinity.	☒Endangered ☐Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Northern Long-eared Bat *Myotis septentrionalis*	**None** observed during field investigations.	No suitable habitat maternity colony or hibernacula habitat occurred in Project Location or local vicinity.	☒Endangered ☐Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Aquatic				

Table 3.15: Summary of Protected Species and Habitat

Species Name	Evidence that species is on and/or surrounding proposed location?	Evidence that species' habitat is on and/or surrounding proposed location?	Species Classification (provided in SARO List)	Is species' habitat currently protected under Section 10 of ESA?[1]
Spotted Gar *Lepisosteus oculatus*	**None** observed during field investigations.	No suitable habitat occurred in Project Location or local vicinity.	☐Endangered ☒Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
American Eel *Anguilla rostrata*	**None** observed during field investigations.	No suitable habitat occurred in Project Location or local vicinity.	☒Endangered ☐Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected
Eastern Pondmussel *Ligumia nasuta*	**None** observed during field investigations.	No suitable habitat occurred in Project Location or local vicinity.	☒Endangered ☐Threatened	☐No ☐Yes, habitat protected via habitat regulation ☒Yes, general habitat is protected

1- Note all species currently without habitat protection will have general habitat protection on June 30, 2013.

Table 4.1: Assessment of Reasonable Alternatives

Description of alternative	Explanation of why this alternative is not reasonable for the proponent	Anticipated adverse effects on protected species and/or habitat		Proposed actions for minimizing adverse effects	
		Protected Species	Protected Habitat	Protected Species	Protected Habitat
Null Alternative – halt project permanently	Windlectric has a contract in place with the Provincial government to assist in the government's mandate to reduce reliance on coal by installing renewable energy projects. (FIT Contract No. F-001563-WIN-130-601). Halting construction permanently would defunct the current contract with the provincial government, and would not allow Windlectric to contribute to the provincial mandate of establishing more sources of renewable energy. Not proceeding with the contract would also result in cost penalties paid to the provincial government.	No adverse effects if alternative is implemented	No adverse effects if alternative is implemented	No installation of access roads, wind turbines.	No installation of wind project.
Cancelling construction of access roads, turbines in Bobolink and Eastern Meadowlark, Whip-poor-will or SAR Turtle habitat (see Figures 4.0-4.8, 3.0-3.8 and 2.0-2.8 respectively)	Windlectric has a contract in place with the Provincial government to assist in the government's mandate to reduce reliance on coal by installing renewable energy projects. Removal of turbines could cause the Project to be unable to meet the installed capacity obligation under the power purchase contract (see Figure 5.0). Furthermore the Project would not meet the minimum economic criteria and would not proceed. Windlectric would not be able to contribute to the provincial mandate of establishing more sources of renewable energy.	No adverse effects if alternative is implemented	No adverse effects if alternative is implemented	None	No installation of access roads, wind turbines in Bobolink, Eastern Meadowlark, Eastern Whip-poor-will or SAR Turtle habitat.
Relocation of access roads, turbines in Bobolink and Eastern Meadowlark, Eastern Whip-poor-will or SAR Turtles habitat (see	Siting of wind turbines is constrained by a number of factors (see Figure 5.0). Wind turbines may only be sited on participating lands. Within these lands, minimum setback distances between turbines and noise receptors (as	No adverse effects if alternatives are implemented.	No adverse effects if alternatives are implemented.	None	No installation of access roads, wind turbines in Bobolink, Eastern Meadowlark, Eastern Whip-poor-will or SAR Turtle habitat.

Table 4.1: Assessment of Reasonable Alternatives

Description of alternative	Explanation of why this alternative is not reasonable for the proponent	Anticipated adverse effects on protected species and/or habitat		Proposed actions for minimizing adverse effects	
		Protected Species	Protected Habitat	Protected Species	Protected Habitat
Figures 4.0-4.8, 3.0-3.8 and 2.0-2.8 respectively)	established by the Province) significantly constrain placement of turbines. Due to the location of this Project (Amherst Island), alternate placement locations for turbines and access roads would likely include habitat for one of the listed species (see Figure 6.0).				
Construct the Wind Project in the proposed Project Location with implementation of mitigation measures to minimize adverse impacts to Bobolink, Eastern Meadowlark, SAR Turtles, and Eastern Whip-poor-will (see Figures 4.0-4.8, 3.0-3.8 and 2.0-2.8 respectively)	Windlectric has a contract in place with the Provincial government to assist in the government's mandate to reduce reliance on coal by installing renewable energy projects. Minimum setback distances between turbines and noise receptors set by the Province are in accordance with the Project Location layout design. A significant amount of work has been completed to meet all required variables for turbine placements, and to confirm noise and environmental setbacks for the solar farm while incorporating consideration for minimizing impacts to species at risk and their habitats.	Potential for direct and indirect effects (mortality and/or disturbance)	Yes – habitat will be removed for the construction and operation of the Wind Project.	Discussed in **Sections 7.0, 8.0, and 9.0**	Discussed in **Sections 7.0, 8.0, and 9.0**

Table 5.1: Summary of Anticipated Effects on Protected Species at Risk and/or their Habitat

Species Affected	Adverse effects on species	Adverse effects on habitat	Proposed avoidance measures	Proposed mitigation measures
Eastern Whip-poor-will	Potential to harm species	Removal of **0.14** ha of habitat (for project duration) and **1.8** ha of habitat for construction of the Project (i.e. short-term)	Where possible road construction and site preparation for project components adjacent to confirmed Eastern Whip-poor-will habitat should minimized between September 1 and April 30, to avoid potential disturbance during to Eastern Whip-poor-will**.**	Mitigation measures for vegetation removal, spills, dust and waste to be implemented as outlined in Section 6.1 of this report. Post construction mortality monitoring will be conducted twice weekly (3 - 4 day intervals) mortality monitoring at ten turbines from May 1 to October 31, and weekly monitoring for raptors during November, for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents (as detailed in the Environmental Effects Monitoring Plan, Amherst Island Wind Project Design and Operations Report). All persons entering the site should be provided training about Eastern Whip-poor-will and proper steps to take upon encountering a Eastern Whip-poor-will; Maintenance vehicle traffic on access roads will primarily be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less. Speed limit signage will be erected to communicate 30km/hr limit. All observations of Eastern Whip-poor-will on the site should be recorded and submitted to MNR, with any observed fatalities reported to MNR immediately.
Bobolink and Eastern Meadowlark	Potential to harm species	Removal of **17** ha of habitat (for project duration) and **77** ha of habitat for construction of the Project (i.e. short-term) for Eastern Meadowlark. Removal of 136 ha of habitat (for project duration) and 60 ha of habitat for construction of the Project (ie. short-term) for Bobolink.	Vegetation clearing in grassland habitat should occur between August 15 and May 15, to avoid nesting Bobolinks and Eastern Meadowlarks.	Mitigation measures for vegetation removal, spills, dust and waste to be implemented as outlined in Section 6.1 of this report Post construction mortality monitoring will be conducted twice weekly (3 - 4 day intervals) mortality monitoring at ten turbines from May 1 to October 31, and weekly monitoring for raptors during November, for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents (as detailed in the Environmental Effects Monitoring Plan, Amherst Island Wind Project Design and Operations Report).

Appendix C

Qualifications

Andrew Taylor B.Sc.

Ecologist

Andrew Taylor is a knowledgeable terrestrial ecologist and project manager. He has successfully managed both small and large projects, including environmental impact statements, constraint analyses and environmental implementation reports. In addition, he has coordinated natural heritage components of Environmental Assessments. These projects involve the implementation of natural heritage policies of the Ontario Provincial Policy Statement, Greenbelt Plan and municipal policy documents. He is familiar with various Acts and their application to projects, including the *Migratory Birds Convention Act, Endangered Species Act, Species at Risk Act* and others. Andrew also has experience with policies pertaining to Threatened and Endangered Species including Butternut.

Andrew has strong field skills including identification of vascular plants, breeding amphibians (calling frogs and toads), breeding salamanders (adult and egg studies), reptiles and bats, with a particular emphasis on birds, butterflies and dragonflies. He is skilled at assessing wildlife habitat, applying Ecological Land Classification (ELC) and delineating wetland boundaries. Andrew is experienced at analyzing natural heritage features for the presence of Significant Woodlands or Significant Wildlife Habitat using guidance documents such as the 'Natural Heritage Reference Manual, How Much Habitat is Enough?' and the 'Significant Wildlife Habitat Technical Guide'.

Andrew has provided terrestrial ecology expertise in a wide range of sectors, including urban lands, energy (including renewable energy), recreational development, infrastructure and aggregate extraction.

EDUCATION

B.Sc. (Hons), University of Guelph / Environmental Toxicology, Guelph, Ontario, 2001

Certificate, Ecological Land Classification for Southern Ontario, Turkey Point, Ontario, 2006

AWARDS

2000 University of Guelph, Dean's List

1997 University of Guelph, Dean's List

PROJECT EXPERIENCE

Aggregate Services

Proposed Bromberg Pit, Ayr, Ontario (Terrestrial Ecologist)
Natural environment field inventories with emphasis on Species at Risk (SAR).

Neubauer Pit, Town of Puslinch, Ontario (Terrestrial Ecologist)
Natural environment field inventories with emphasis on Species at Risk (SAR).

Dufferin Aggregates Acton Quarry Extension, Acton, Ontario (Terrestrial Ecologist)
The extension of the existing Acton Quarry is proposed to meet the need for additional close-to-market aggregate resources of high quality Amabel Dolostone. Andrew has conducted extensive ecological field surveys and habitat assessments for breeding birds, amphibians and mammals with specific emphasis on Species at Risk (SAR).

St. Marys Cement Flamborough Quarry License Environmental Impact Study and Level 2 Natural Environment Technical Report (Ecologist)
Identification and impact assessment of natural heritage features, compensation and management plan for Species at Risk (Butternut), water balance to maintain provincially significant wetland, salamander habitat and migration study, assessment of provincially significant woodland and significant wildlife habitat, environmental impacts of transportation.

** denotes projects completed with other firms*

Andrew Taylor B.Sc.

Ecologist

Electrical Power Distribution

Bruce to Milton Transmission Reinforcement Project, Multiple Sites, Ontario (Terrestrial Ecologist)

Terrestrial surveys related for Species at Risk (SAR) protected under the provincial Endangered Species Act (2007).

Coote's Paradise Transmission Reinforcement Project, Hamilton, Ontario (Terrestrial Ecologist)

Terrestrial surveys included vegetation community assessments, floral inventory, with emphasis on Species at Risk (SAR).

Natural Sciences & Heritage Resources

Crates Marina, Keswick, Ontario (Project Manager / Ecologist)

Environmental policies, approvals and desgin. Identification of natural heritage features and sensitive species.

Kortright East Development, Guelph, Ontario (Project Manager / Ecologist)

Envrionmental Implementation Report. Vegetation buffers, wildlife corridor, tree conservation plan, planning and design of invasive species removal, design of compliance and performance monitoring program.

Southeast Sutton Development Area Plan, Sutton, Ontario (Project Manager / Ecologist)

Environmental policies, approval and design. Identification of natural heritage features and constraints for Development Area Plan. Plan of Subdivision forest buffers, mitigation of impacts to forest resources, sensitive vegetation and Species at Risk. Participation in Ontario Muncipal Board discussions.

Fourteen Mile Creek Development, Oakville, Ontario (Ecologist)

Natural Heritage Monitoring Program Director - directed monitoring program of vegetation communities, change in species composition, avian wildlife, aquatic Species at Risk, benthic invertebrate communities, hydrogeology, geomorphology and erosion.

Activa Waterloo East, Waterloo, Ontario (Ecologist)

Terrestrial and Aquatic Monitoring Program - monitoring of vegetation communties, changes in species composition and disturbance levels were undertaken, interpreted and reported. Directed monitoring of benthic invertebrate communities.

Oil & Gas

Bickford to Dawn Pipeline Project, Chatham, Ontario (Terrestrial Ecologist)

Terrestrial surveys included vegetation community assessments, floral inventory and Species at Risk (SAR) habitat assessments. Study design and development in conjunction with local Ontario Ministry of Natural Resources (OMNR) district for Eastern Foxsnake, including a SAR 17b permit application.

Renewable Energy

Environmental Screening Report / Environmental Review Report, Multiple Projects, Various Sites, Ontario (Terrestrial Ecologist)

Environmental Screening Reports (ESR's)/Environmental Review Reports (ERR's) were prepared for various wind energy projects in compliance with the Ministry of the Environment's Guide to Environmental Assessment Requirements for Electricity Projects and the Canadian Environmental Assessment Act (CEAA). Andrew's involvement included pre-construction study design, coordination and conducting of monitoring for avian and other wildlife species, including targeted surveys for Species at Risk (SAR). Avian studies included breeding grassland and forest birds, wintering raptors and migratory surveys for waterfowl, raptors, passerines and shorebirds. Andrew also conducted and coordinated acoustic bat surveys including data collection, species identification, data analysis and reporting, and co-authoring technical reports as part of the following projects:

- Wolfe Island Wind Project (Wolfe Island, Ontario; 86 turbines);

- Port Alma Wind Power Project (Municipality of Chatham-Kent, Ontario; 44 turbines);

- Plateau Wind Project (Municipality of Grey Highlands & Melancthon Township, Ontario; 18 turbines);

- Kingsbridge II Wind Project (Huron County, Ontario; 69 turbines);

- Gosfield Comber Wind Energy Project (Essex County, Ontario; 149 turbines);

- Chatham Wind Power Project (Municipality of Chatham-Kent, Ontario; 44 turbines); and

- Melancthon Wind Plant, Phases I & II (Melancthon and Amaranth Townships, Ontario; 177 turbines)

** denotes projects completed with other firms*

Andrew Taylor B.Sc.

Ecologist

Post-construction Monitoring Programs, Multiple Projects, Various Sites, Ontario (Terrestrial Ecologist)

The post-construction of monitoring of renewable energy projects assess the direct impacts to birds and bats and indirect impacts to breeding, migrating and wintering wildlife. The purpose of post-construction monitoring programs is to verify predictions of the pre-construction assessment and if necessary, implement appropriate measures to mitigate adverse effects. Andrew has coordinated and conducted monitoring field studies including assessment disturbance to grassland, forest and wetland breeding birds, staging waterfowl and shorebirds, tundra swans and wintering raptors and co-authored or authored the post-construction monitoring reports for the following projects:

- Wolfe Island Wind Project (Wolfe Island, Ontario; 86 turbines);
- Melancthon Wind Plant, Phase I & II (Melancthon & Amaranth Townships, Ontario; 177 turbines);
- Kingsbridge I Wind Plant (Huron County, Ontario; 22 turbines); and
- Port Alma Wind Power Project (Municipality of Chatham-Kent, Ontario; 44 turbines);

Renewable Energy Approval (REA), Multiple Projects, Various Sites, Ontario (Terrestrial Ecologist)

Natural Heritage Assessments (NHA's) and Environmental Impact Studies (EIS's) were prepared in accordance with Ontario Regulation 359/09 issued under the Environmental Protection Act with guidance obtained from the Draft Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2010). NHA's included records review and site investigation which included, but not limited to, vascular plant surveys. Ecological Land Classification (ELC) and wildlife surveys for avian species, amphibians, reptiles, mammals and invertebrates. Results of the field investigations were used to identify and evaluate significant natural heritage features including wetlands, woodlands, valleylands and significant wildlife habitat. Outside the REA process, field surveys and habitat assessment were completed for species protected under the provincial Endangered Species Act.
Andrew coordinated and conducted field studies, habitat assessments for Species at Risk (SAR), authored technical reports and public consultation for the following renewable energy projects:

- Grand Renewable Energy Park (Haldimand County, Ontario; 69 turbines and solar totalling 253.1 MW);
- Port Dover and Nanticoke Wind Project (Norfolk and Haldimand Counties, Ontario; 58 turbines);
- Ostrander Wind Energy Park (Prince Edward County, Ontario; 9 turbines);
- Fairview Wind Farm (Simcoe County, Ontario; 4 turbines);
- Whittington Wind Farm (Dufferin County, Ontario; 3 turbines);
- Springwood Wind Farm (Wellington County, Ontario; 4 turbines); and
- Brooke-Alvinston Wind Farm (Lambton County, Ontario; 4 turbines)

Research / Laboratories

Rice Lake Plains Joint Initiative*, Northumberland County, Ontario (Ecologist)

Tallgrass prairie research program. Identification and detailed cataloging of remnant tallgrass prairie sites, landowner liaison and education, development of tallgrass prairie management plans, reporting of findings.

Alderville First Nations Black Oak Savannah*, Alderville, Ontario (Ecologist)

Tallgrass prairie and black oak savannah research program. Technical reporting. Vegetation monitoring, tallgrass prairie reconstruction, wildlife monitoring, Species at Risk reintroduction.

Sports, Recreation & Leisure

Sunnidale Park Master Plan, Barrie, Ontario (Ecologist)

Identification and delineation of ecological management units. Design of management plans for ecological units, wetland and forest habitat rehabilitation. Technical reporting.

Transportation Planning

City of Toronto Fort York Pedestrian Footbridge, Toronto, Ontario (Terrestrial Ecologist)

Coordinated Natural Sciences component of project including assessment of potential impacts, with an emphasis on Species at Risk (SAR).

Natural Science Reports Related to MTO Highway Improvement Works, Various Sites, Ontario (Terrestrial Ecologist)

Produced numerous Natural Sciences reports related to highway improvement works. Where required, Fisheries Act authorization was obtained and Fish Habitat Compensation Plans were developed. Potential impacts to terrestrial vegetation, wetlands and wildlife were described for the following studies:
- Highway 3 (Essex County): Preliminary Design Study;
- Highway 40 (Municipality of Chatham-Kent): Detail Design Study;
- Highway 11 (Town of Bracebridge): Preliminary Design;
- Highway 24 (Cambridge): Detailed Design;

** denotes projects completed with other firms*

Andrew Taylor B.Sc.

Ecologist

- Highway 8 (Perth County): Detailed Design;
- Highway 401 (Kitchener): Post-construction Compliance Monitoring;
- Highway 401 (Essex County, near Comber): Post-construction Compliance Monitoring;
- Highway 26 (County of Grey): Post-construction Compliance Monitoring;
- Highway 17 (Sudbury): Preliminary Design Study;
- Highway 9 (Municipality of South Bruce): Post-construction Compliance Monitoring.

** denotes projects completed with other firms*

Katherine St. James MSc, BSc

Terrestrial Ecologist

Katherine St. James is a Terrestrial Ecologist certified in Ecological Land Classification (ELC) with several years' experience in ecological field surveys, specializing in herpetofauna and bird surveys. She has been employed in both the public and private sectors. Her experience spans on a range of projects such as Species at Risk, wind development and monitoring, wetland restoration, wildlife hazard management, environmental impact studies, and various other development projects.

Katherine has successfully managed both small and large projects, including environmental impact statements (EIS), constraint analyses, and natural heritage assessments for wind, solar, and hydroelectric. She is familiar with various Acts and their application to projects, including the Migratory Birds Convention Act, Endangered Species Act, Species at Risk Act, and others.

EDUCATION

B.Sc. (Hons) of Environmental Science, Minor in Biology, University of Waterloo, Waterloo, Ontario, 2005

M.Sc. of Geography and Environmental Management, University of Waterloo, Waterloo, Ontario, 2009

Ontario Provincial Ecological Land Classification (ELC), Timmins, Ontario, 2012

PROJECT EXPERIENCE

Environmental Assessment

Brantford -Kirkwall Pipeline, Brantford, Ontario (Terrestrial Lead)
Terrestrial lead managing field investigations, including correspondence with client and agencies. Provided development of methods and field survey protocols.

Sprott Power Wind Proect Analysis, Ontario (Ecologist)
Analyzed status and viability of various wind farms available for purchase throughout Ontario

Algonquin Power's Amherst Island Wind Farm, Amherst Island, Ontario (Terrestrial Ecologist)
Produced NHA and EIS reports for a 37-turbine wind farm located on Amherst Island, Ontario.

Suncor's Cedar Point Wind Farm, Forest, Ontario (Terrestrial Ecologist)
Produced NHA and EIS reports for this 72-turbine wind farm located near Chatham, Ontario.

Cambridge Hydro EIS - Preston 27 kv Feeder, Cambridge, Ontario (Terrestrial Ecologist)
Managed field work, mapping and produced EIS report for this hydro-line upgrade in Cambridge, Ontario.

Renewable Energy Natural Heritage Assessments*, Ontario (Project Manager)
Conducted terrestrial evaluations including Ecological Land Classification, wildlife habitat assessments, and Species at Risk evaluations for various wind and solar projects including Oxley Wind Farm, Silvercreek Solar Park, 77 Netherby Solar Park, Armow Wind Farm, South Kent Wind Farm, and Skyway 124 Wind Farm.

Wetland Restoration*, Chatham, Ontario
Created wetland EIS and detailed restoration plan for Mud Creek Provinically-Significant Wetland after construction occurred within wetland.

** denotes projects completed with other firms*

Katherine St. James MSc, BSc

Terrestrial Ecologist

PUBLICATIONS

The Ecological Effects of Cleared Boundaries of BPNP. *Master's Thesis*, 2009.

"How We Mark Our Territory". *2009 A.D. Latornell Conference Symposium*, 2009.

"Assessing Stream Management Needs on Public Land in Pinedale, Wyoming". *Conference Presentation at 2007 CAG-ONT*, 2007.

Predicting Birdstrike Hazard from Gulls at Landfill Sites. *International Bird Strike Committee, Warsaw Poland*, 2003.

Nicole Kopysh BES

Ecologist / Project Manager

Nicole Kopysh is a Terrestrial Ecologist and Project Manager who has been involved in projects of varying sizes from multiple sectors including aggregates, renewable energy and development. Nicole has successfully managed or directed the natural terrestrial field programs and reporting requirements for Environmental Impact Assessments, constraints analyses, natural environment technical reports, Environmental Implementation Reports, Natural Heritage Assessments for the Renewable Energy Assessment program and natural heritage monitoring programs. These have included extensive agency and public consultation and Nicole demonstrates effective communication skills in the execution of these projects.

Nicole's experience involves the implementation of the natural heritage policy of the Ontario Provincial Policy Statement, Greenbelt Plan, *Oak Ridges Moraine Act*, *Migratory Birds Convention Act*, *Green Energy Act* and municipal policy documents for municipal draft plan applications throughout southern Ontario. Nicole is also experienced with the interpretation and application of the *Endangered Species Act* (ESA), including the development and completion of permit applications under the ESA. Nicole is a skilled birder and has field experience conducting bird surveys, Species At Risk surveys, general terrestrial monitoring and assessments, wildlife inventories and habitat assessments. She is a member of the steering committee for Environment Canada's and the Canadian Wind Association's Bird Monitoring Database Project.

EDUCATION

BES, University of Waterloo / Bachelor of Environmental Studies, Honours Environment and Resource Studies, Co-op Program, Waterloo, Ontario, 1998

MEMBERSHIPS

Member, Society of Canadian Ornithologists

Member, Ontario Field Ornithologists

PROJECT EXPERIENCE

Aggregate Services

Neubauer Pit, Township of Puslinch, Ontario (Project Assistant, Ecologist)
Natural environment field inventories and Level II Natural Environment Technical Report

Hillsburgh Huxley Pit, Hillsburgh, Ontario (Project Assistant, Ecologist)
Natural environment field inventories, Woodlot Assessment of Sighificance and Level II Natural Environment Technical Report

Proposed Bromberg Pit, Ayr, Ontario (Project Assistant, Ecologist)
Natural environment field inventories and Level I Natural Environment Techncial Report

Commercial / Retail Development

First Capital Holdings Trust, Guelph, Ontario (Project Manager)
Envrionmental Implementation Report. Vegetation buffers, wildlife corridor, tree conservation plan, planning and design of invasive species removal, design of compliance and performance monitoring program.

Natural Sciences & Heritage Resources

Forest Bird Research - Canadian Wildlife Service* (Field Assistant)
Located Wood Thrush nests, monitored nesting success, banded adult and nestling birds, and conducted vegetation surveys.

Forest Bird Research - Smithsonian Institution* (Field Assistant)
Located and monitored Hooded Warbler nests and conducted insect sweep net sampling. Located Blue-headed Vireo nests and conducted playback experiments.

** denotes projects completed with other firms*

Nicole Kopysh BES

Ecologist / Project Manager

Ontario Breeding Bird Atlas - Ontario Nature-Federation of Ontario Naturalists* (Assistant Coordinator)
Coordinated and managed various aspects of a province-wide conservation/research project. This involved coordinating coverage to ensure project goals were met; hiring, training and managing contract staff; development of funding proposals; coordination of field work; management of volunteers and working committees; assistance in preparation of Atlas book for publication.

Colonial Marshbird Census - Bird Studies Canada* (Project Coordinator)
Developed the project outline, scope, organization and staffing. Scheduled the project timelines and tasks. Performed key field work in marshes throughout southern Ontario.

Ontario Eastern Screech-owl Survey - Ontario Breeding Bird Atlas* (Project Manager)
Developed project proposal, project timeline, schedule and budget. Responsible for communications, data management and handling. Launched survey and coordinated volunteer involvement.

Renewable Energy

Post-construction: Renewable Energy Projects, Various Sites, Ontario (Team Lead - Field Program and Technical Reporting)
Post-construction monitoring and reporting for various wind energy projects in Ontario, including:
• Melancthon I Wind Plant
• Wolfe Island Wind Power Project

Pre-construction: Renewable Energy Projects, Various Sites, Ontario (Team Lead - Field Program and Technical Reporting)
Study design, direction of field programs, agency and public consultation, evaluation and assessment of natural features, significant wildlife habitat, presence of Species At Risk, assessment of project impacts and preparation of final reports for the following projects:
• White Pines Wind Project Natural Heritage Assessment, Environmental Impact Study and Endangered Species Act Assessment and Permitting
• Ostrander Point Wind Energy Park Natural Heritage Assessment, Environmental Impact Study and Endangered Species Act Assessment and Permitting
• Springwood Wind Project Natural Heritage Assessment
• Whittington Wind Project Natural Heritage Assessment, Environmental Impact Studies and Endangered Species Act Assessment and Permitting
• Port Dover and Nanticoke Wind Project Natural Heritage Assessment, Environmental Impact Study and Endangered Species Act Assessment and Permitting
• Brooke-Alvinston Wind Project Natural Heritage Assessment

Chinodin Melancthon and Grey Highlands Wind Projects, Ontario (Terrestrial Ecologist)
Coordinating and conducting monitoring of bats and migratory and breeding birds for wind turbine development.

Proton Wind Program, Southgate Township, Ontario (Terrestrial Ecologist)
Coordinating and conducting monitoring of migratory and breeding birds for wind turbine development, preparation of comprehensive technical appendix to the Environmental Screening Report.

Wolfe Island Wind Power Project, Wolfe Island, Ontario (Terrestrial Ecologist)
Study design, coordination and conducting of monitoring for spring migratory birds, fall migrating raptors, staging waterfowl, winter raptors and grassland bird populations. Design and conducting specific studies to target avian Species at Risk. Assessment of amphibian populations, mammal populations, and wildlife corridors. Preparation of technical report appendix to the Environmental Screening Report.

Residential Development

Almas Property, Hamilton, Ontario (Project Manager)
Environmental Impact Statement and Natural Heritage Assessment

Golhar Residence, Hockley Valley, Ontario (Project Manager)
Development of environmental review for a proposed pond located within the Niagara Escarpment Protection Area.

Glaspell Homeowner's Guide, Whitby, Ontario (Project Manager)

** denotes projects completed with other firms*

Nicole Kopysh BES

Ecologist / Project Manager

Fourteen Mile Creek Long-term Natural Heritage Monitoring Program, Oakville, Ontario (Natural Heritage Monitoring Project Director)

A watershed-based inventory and monitoring program for a study area in the Fourteen Mile Creek watershed was developed in association with the Conservation Authority to assess human induced stress on the greater ecosystem. The program included one year of inventory work and four subsequent years of monitoring and incorporated the following components: streamflow and rainfall monitoring, erosion and creek morphology, groundwater, vegetation and Ecological Land Classification, breeding birds, fish, water quality and benthos.

Sports, Recreation & Leisure

Clublink Wyndance Golf Coures, Uxbridge, Ontario (Project Manager)

Natural heritage assessment and development of environmental report addendum and significant species plan.

** denotes projects completed with other firms*

Nicole Kopysh BES

Ecologist / Project Manager

PUBLICATIONS

Eastern Screech-Owl pp. 290-291. *Atlas of the Breeding Birds of Ontario*, 2007.

Kopysh, N. Other Owls!. *Ontario Breeding Bird Atlas Newsletter. Vol 5, Issue 1.*, 2005.

Kopysh, N. On the Prowl for Owls. *OFO News 22(1): 12-13.*, 2004.

Kopysh, N. and C. Weseloh. Reporting Colonial Species. *Ontario Breeding Bird Atlas Newsletter. Vol 3, Issue 2.*, 2003.

Kopysh, N. Owling for EASO. *Ontario Breeding Bird Atlas Newsletter. Vol 3, Issue 2.*, 2003.

Buehler, D.M., D.R. Norris, B.J.M. Stuchbury and N.C. Kopysh. Food Supply and Parental Feeding Rates of Hooded Warblers in Forest Fragments. *Wilson Bulletin 114(1), 122-127.*, 2002.

Morton, E., J. Howlett, N.C. Kopysh and I. Chiver. Overcoming the cost of male incubation: blue-headed vireos memorize the locations where intruders sing. *In submission to Proc Royal Soc of London, biology letters.*, 2002.

Timmermans, S. and N. Kopysh. What's Happening With Colonial Marshbirds?. *Ontario Breeding Bird Atlas Newsletter. Vol 1, Issue 2.*, 2001.

James Leslie B.E.S.

Terrestrial Ecologist

James Leslie has over six years of experience as a Terrestrial Ecologist with Stantec and is the Technical Lead for vegetation field studies. While James has acquired a diverse skill set, he has become a specialist in vegetation ecology with expertise in plant identification, Ecological Land Classification (ELC), wetland delineation, and vegetation monitoring. Additionally, he has gained extensive experience conducting and leading herpetofauna field surveys.

James completed his Bachelor of Environmental Studies at the University of Waterloo with a focus on applied ecology and environmental policy. He has obtained certification for Ecological Land Classification (ELC), Ontario Wetland Evaluation System (OWES), Ecological Monitoring and Assessment Network (EMAN), and is a Ministry of Natural Resources (MNR) designated Butternut Health Assessor for the endangered Butternut tree. He is RAQS-certified by the Ontario Ministry of Transportation (MTO), and can lead natural heritage assessments for MTO projects. James is familiar with legislation that applies to natural heritage assessment, including the Provincial Policy Statement (PPS), the *Endangered Species Act, 2007* and the federal *Species at Risk Act* (SARA).

James provides expertise in a variety of sectors including aggregate extraction, infrastructure, energy, and urban land development. He has gained extensive experience conducting and leading vegetation related surveys for renewable energy and highway infrastructure projects. He has authored a variety of reports, including natural heritage components of Environmental Impact Studies, Environmental Assessments, and Natural Environment Technical Reports.

EDUCATION

B.E.S., University of Waterloo / Environmental Studies / Geography, Waterloo, Ontario, 2006

Certificate, Humboldt Field Research Institute / Applied Field Identification of Grasses and Sedges, Steuben, Maine, 2010

Certificate, Butternut Health Assessment, Burlington, Ontario, 2009

Certificate, Ontario Wetland Evaluation System, North Bay, Ontario, 2009

Certificate, Ecological Monitoring and Assessment Network, Turkey Point, Ontario, 2008

Certificate, Ecological Land Classification for Southern Ontario, Kingston, Ontario, 2007

MEMBERSHIPS

Member, Botanical Society of America

Member, Field Botanists of Ontario

PROJECT EXPERIENCE

Aggregate Services

Proposed Duntroon Quarry Expansion, Duntroon, Ontario (Terrestrial Ecologist)

Designed and conducted a multi-year research program to assess the habitat characteristics of American hart's-tongue fern – a federal and provincial Special Concern species. Research examined various features of soil, ambient air, tree canopy cover, associate species, and snow depth. The purpose of this research was to compare and contrast known habitat with potential transplant locations. A preliminary transplant of over 500 ferns was conducted where post-transplant monitoring studies are ongoing. Unrelated surveys conducted onsite include butternut health assessments and forest plot assessments using protocols outlined in the Ecological Monitoring and Assessment Network (EMAN).

Proposed Flamborough Quarry, Hamilton, Ontario (Ecologist)

Aquatic surveys included stream flow discharge and uploading of data loggers. Terrestrial surveys included winter wildlife surveys and health assessments of over 100 butternut trees using 2009 OMNR guidelines.

James Leslie B.E.S.

Terrestrial Ecologist

Acton Quarry Environmental Review, Acton, Ontario (Terrestrial Ecologist)

Assist with extensive amphibian surveys to identify significant wildlife habitat, species composition, and presence or absence of pure Jefferson salamander specimens. Surveys included call-counts, egg mass surveys, pit and aquatic trapping, and tail clippings of potential Jefferson species (in conjunction with the OMNR). Assisted with surveys in 2007 and thereafter, which remain ongoing.

Environmental Mitigation and Monitoring

Various Urban Lands Projects, Waterloo and Oakville, Ontario (Terrestrial Ecologist)

Monitor vegetation communities using Ecological Monitoring and Assessment Network (EMAN) and local Conservation Authority guidelines. Field surveys consisted of identifying vascular plants growing within pre-determined plots and determining their respective cover; photographic records were compiled each year for temporal comparison. Data analysis included calculation of frequency, dominance, and importance value.

Georgia Pacific PCB Remediation, Thorold, Ontario (Terrestrial Ecologist)

ELC; mapping and evaluation of species at risk (Butternut); develop vegetation monitoring plots to determine density, frequency, dominance, and importance value; data synthesis, and technical memorandum.

Oil & Gas

Union Gas Lobo Compressor Station Expansion, Strathroy, Ontario (Terrestrial Ecologist)

Assist with Project Management of a proposed compressor station expansion, including proposal and budget; conduct/delegate appropriate field surveys; compile background data through review of Official Plan, Significant Wildlife Habitat Technical Guide, Ontario Provincial Policy Statement, etc.; agency consultation. Deliverables consisted of an Environmental Impact Study report.

Power Transmission & Distribution

Bruce to Milton Transmission Project, Milton, Ontario (Terrestrial Ecologist)

180 km linear study area of proposed hydro transmission lines from Bruce Nuclear to Milton, Ontario. Assisted with ELC, butternut health assessments, flora inventories, and winter wildlife surveys.

Renewable Energy

Terrestrial Surveys for Wind and Solar Projects, Various Municipalities, Ontario (Terrestrial Ecologist)

Conducted numerous site assessments based on the Renewable Energy Approvals (REA) process for proposed layouts near Belwood, Port Dover, Sydenham, Whittington, St. Columban, and Prince Edward County. Field work included ELC, wetland delineations and evaluations using the Ontario Wetland Evaluation System (OWES), floral and faunal species inventories, and identification of significant wildlife habitat. Study areas included proposed turbine locations, access roads, and transmission corridors. Data analysis and summaries were provided in the respective Natural Heritage Assessment Reports.

Island Falls Energy Project, Smooth Rock Falls, Ontario (Terrestrial Ecologist)

Field work component of a proposed hydroelectric dam in Northern Ontario. Assist with ELC, botanical inventory, and soil surveys in remote areas.

Avian Surveys for Wind and Solar Projects, Various Municipalities, Ontario (Terrestrial Ecologist)

Avian monitoring was conducted at Kingsbridge, Melancthon, Ostrander, Parkhill, and Plateau wind energy locations. Field work consisted of installation, troubleshooting, and data retrieval of Anabat SD1 monitoring devices. Received training for data interpretation and isolation of bat calls based on digital graph patterns. Post-construction surveys of avian mortality under active wind turbines were completed for the Kingsbridge and Melancthon locations.

Terrestrial Assessments

Master Service Plan, Cayuga and Jarvis, Ontario (Terrestrial Ecologist)

Develop ELC mapping for the towns of Jarvis and Cayuga. The purpose was to update natural heritage data for the respective Master Service Plan revisions. Data analysis included ecological constraints mapping and authoring a technical memorandum.

** denotes projects completed with other firms*

James Leslie B.E.S.

Terrestrial Ecologist

Transportation Planning

Highway 3 Rehabilitation, Detail Design, Renton to Jarvis, Ontario (Terrestrial Ecologist)

This work was conducted to identify natural features where road widening and culvert replacement was proposed. Performed ELC and compiled records of local flora and fauna. The study area included Endangered butternut trees and a variety of forested, wetland, and cultural communities. A Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitat. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines.

Highway 69, Preliminary Design, Patrol Yard Selection, Parry Sound to Sudbury, Various Sites, Ontario (Terrestrial Ecologist)

This study was undertaken in order to assess a number of alternative locations for patrol yards within the study area, and to identify preferred alternatives at three locations. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. Natural heritage features consisted of numerous wetland communities, large, contiguous forests, significant wildlife habitat and observations of a Threatened species. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Highway 17, Preliminary Design, Sudbury Southwest Bypass, Sudbury, Ontario (Terrestrial Ecologist)

The purpose of this study was to identify a four-lane highway plan for a section of Highway 17 through the Sudbury area, with access restricted to interchange locations only. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included a variety of upland and wetland habitats, including Areas of Natural and Scientific Interest. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Highway 11, Preliminary Design Study, Access Review from Powassan to Callander, Ontario (Terrestrial Ecologist)

This project was part of a study to upgrade the highway to 'full freeway standard', which included eliminating at-grade intersections and entrances and providing access to highway only at interchanges. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included a variety of upland and wetland habitats. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Highway 401 and Highway 8 Improvements, Preliminary Design, Kitchener, Ontario (Terrestrial Ecologist)

This study was undertaken to assess proposed interchange improvements in the cities of Kitchener and Cambridge along Highway 401 and Highway 8. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included rare flora, Provincially and Locally Significant Wetland, and an Area of Natural and Scientific Interest (ANSI). A Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats. The preliminary impact assessment included constraint ratings of each ELC unit and the calculation of the areas potentially affected by the Preferred Plan. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines.

Highway 11, Preliminary Design Study, Improvements North of Highway 144, Huntsville, Ontario (Terrestrial Ecologist)

The purpose of this study was to undertake the Planning, Preliminary Design and Environmental Assessment for improvements to Highway 11 from 1 km north of Highway 141, northerly for 5.5 km. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included a rare vegetation community not previously documented and a variety of upland and wetland habitat. A Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

** denotes projects completed with other firms*

James Leslie B.E.S.

Terrestrial Ecologist

Highway 11, Preliminary Design Study, South Entrance to Powassan, Powassan, Ontario (Terrestrial Ecologist)

This study was carried out to update a Preliminary Design Report that recommended interchange locations for this stretch of Highway 11. Performed ELC, compiled records of local flora and fauna, and identified significant wildlife habitat. The study area included significant features, a variety of habitats, and cultural communities. Fieldwork and reporting were conducted in accordance with MTO regulations and guidelines.

Municipal Road Improvement Projects, Various Sites, Ontario (Terrestrial Ecologist)

Conducted ELC and wetland delineations using OMNR protocols. Identified wildlife habitat and determined potential impacts and mitigation options.
- City of London, Southdale Road Widening
- City of London, Hamilton Road Improvements

Victoria Road North Class EA, Guelph, Ontario (Terrestrial Ecologist)

Assist with Task Management for a proposed road widening, including background data review of applicable legislation and guidelines; conduct or delegate appropriate field surveys; agency consultation; prepare a draft Natural Environment Technical Report and constraints analysis for a proposed parking area.

** denotes projects completed with other firms*

Brandon Holden

Environmental Scientist

Brandon joined Stantec in 2008. He has been birding extensively in Ontario and Eastern North America since 1997. Having recorded 344 species in Ontario, Brandon has a keen personal interest in finding vagrant bird species; highlighted last year by finding and photographing the first Black-tailed Gull (Larus crassirostris) for the province. A recent accomplishment was being voted onto the Ontario Bird Records Committee; the youngest member in its 30 year history. At Stantec, Brandon is responsible for carrying out seasonal bird and wildlife field surveys throughout Ontario, including some lengthy programs at remote sites.

EDUCATION

Lambton College, Sarnia, Ontario, 2007

PROFESSIONAL ASSOCIATIONS

Voting Member, Ontario Bird Record Committee (OBRC)

Member, Bird Studies Canada

Member, Ontario Field Ornithologists

Member, American Birding Association

AWARDS

Finalist, Veolia Wildlife Photographer of the Year, London England, 2009

NatureScapes.net Image of the Week - Multiple Weeks, 2006-2009

Ross Thompson Trophy for Proficiency in Ornithology - 2004

Doug Tarry Young Ornithologist Award - 2002

Hamilton Civic Award - 2002

Ross Thompson Trophy for Proficiency in Ornithology - 2002

PROJECT EXPERIENCE

Research

Port Alma Wind Project, Municipality of Chatham-Kent, Ontario (Environmental Scientist)
Brandon conducted migratory bird surveys.

Sault Ste. Marie Wind Power Project, Algoma District, Ontario (Environmental Scientist)
Brandon conducted migratory bird surveys.

Thunder Bay Wind Power Project, Thunder Bay District, Ontario (Environmental Scientist)
Brandon conducted migratory bird surveys.

Melancthon Wind Project, Dufferin County, Ontario (Environmental Scientist)
Brandon conducted breeding bird surveys.

Ostrander Point Wind Energy Park, Prince Edward County, Ontario (Environmental Scientist)
Brandon conducted surveys on breeding, migratory and wintering birds.

Wolfe Island Wind Project, Wolfe Island, Ontario (Environmental Scientist)
Brandon conducted surveys on breeding, migratory and wintering birds.

Brandon Holden

Environmental Scientist

Sports, Recreation & Leisure

Volunteer Work, Multiple Locations* (Volunteer)

Annual leader of guided hikes for the Ontario Field Ornithologists, including a featured hike leader for two of the past three annual conventions. Brandon continues to volunteer by donating photographs to various provincial and local organizations. He also volunteers with the Hamilton Naturalists Club assisting with the Fall Bird Counts since 2001, and worked with the Haldimand Bird Observatory with bird banding.

Peregrine Prints, Multiple Locations* (Photographer)

Brandon established and maintains his own website, www.peregrineprints.com, showcasing his natural history photography and information. In 2010 the site has attracted over 23,000 visits and captured 800,000 hits as of June 1, 2010.

Emergency Planning / Response

Emergency Medical Care Training, Multiple Locations*

Brandon has taken extensive medical training; starting with general First Aid many years ago. He has upgraded this to Standard First Aid, First Responder and in 2008 obtained certification as an Emergency Medical Responder - the highest level available below Paramedic. Brandon also holds a (60 hour) Emergency Patient Care certificate from Lambton College.

** denotes projects completed with other firms*

Don Graham M.Sc., B.Ed., B.A.

Ecologist

Don Graham is a Field Biologist with Stantec's Terrestrial Team providing environmental management consultation services to projects across Ontario. Don has a diverse background, having completed his Master of Science in Zoology at the University of Guelph and continued his education obtaining a Teaching Certificate from the University of Western Ontario, as well as the Ontario Wetland Evaluation System (OWES) course offered by the Ministry of Natural Resources.

Don has extensive experience conducting terrestrial fieldwork and writing terrestrial components of reports which meet provincial and municipal requirements for Class EA for Transportation Facilities, Municipal Class EA, Environmental Impact Studies and Natural Heritage Evaluations. Don's experience includes transportation, servicing, residential, industrial and commercial projects. His projects have involved a broad spectrum of field survey types including assessment of breeding birds, amphibians, vegetation communities, vegetation species, reptiles and Species at Risk in a variety of habitats within southern, central, eastern and northern Ontario, using protocols of the Ontario Breeding Bird Atlas, Marsh Monitoring Program and Ecological Land Classification. He is familiar with pertinent policies such as the Natural Heritage policies of the Provincial Policy Statement, Conservation Authority Regulatory Areas, the *Endangered Species Act* and the *Migratory Bird Convention Act*, and is experienced at effective regulatory agency liaison.

EDUCATION

B.A., University of Guelph / Psychology, Guelph, Ontario, 1983

M.Sc., University of Guelph / Zoology, Guelph, Ontario, 1987

B.Ed., University of Western Ontario / Ontario Teaching Certificate, London, Ontario, 1990

Certificate, Ministry of Natural Resources / Ontario Wetland Evaluation System, North Bay, Ontario, 2005

Diploma, McMaster University / Spatial Analysis and GIS, Hamilton, Ontario, 2004

MEMBERSHIPS

Member, Field Botanists of Ontario

Member, Ontario Field Ornithologists

Member, Bird Studies Canada

PROJECT EXPERIENCE

Commercial / Retail Development

Various Commercial Development Projects*, Ontario (Biologist)

Conducted terrestrial fieldwork and wrote terrestrial components of Environmental Impact Studies to support Commercial Development projects in Ontario, including:

- Proposed golf course in Kawartha Lakes;
- Existing golf course in Gravenhurst;
- Mall expansion in Cookstown;
- Car dealership in Toronto; and
- Strip mall in Ajax.

Highway and Transportation

Various Highway and Transportation Projects*, Ontario (Biologist)

Conducted terrestrial fieldwork and wrote terrestrial components of Class EA Reports for Transportation Facilities and supporting Technical Reports to support proposed road improvements in Ontario, including:

- New Highway 7 corridor between Kitchener-Waterloo and Guelph;
- Improvements to Highway 7 corridor in Durham Region;
- Improvements to Highway 11 north of Temagami;
- Twinning of Highway 11 in and north of Burk's Falls;
- Twinning of Highway 69 in vicinity of Pointe au Baril;
- Improvements to Highway 11 between Cochrane and Kirkland Lake;
- Bridge improvements and replacements in central Ontario;
- Proposed LRT line in Ottawa;
- Proposed LRT line linking Mississauga and Brampton;

** denotes projects completed with other firms*

- Extension of Peterborough Airport runway;
- Proposed Toronto-Bolton GO rail transit line; and
- Improvements to Toronto-Milton GO rail transit line.

Industrial Development

Various Industrial Development Projects*, Ontario (Biologist)

Conducted terrestrial fieldwork and wrote terrestrial components of Environmental Impact Studies to support Industrial Development projects in Ontario, including projects in Oakville and Toronto, Ontario.

Linear Infrastructure

Various Servicing Projects*, Ontario (Biologist)

Conducted terrestrial fieldwork and wrote terrestrial components of Municipal Class EA Reports and supporting Technical Reports to support proposed linear infrastructure construction in Ontario, including:
- York-Durham Sanitary Sewer development;
- Don River and Waterfront Sewer Improvements, Toronto;
- Horgan Watermain construction in Scarborough;
- Kennedy Road Sewer development in Markham;
- Improvements to sewage lagoon in Neustadt;
- Watermain in Sauble Beach;
- Jet fuel pipeline for Pearson International Fuel Facilities Corp. in Toronto;
- Repair of Trans-Northern Pipelines Inc. in eastern Ontario; and
- Construction of new pipeline for Trans-Northern Pipelines Inc. in eastern Ontario.

Natural Sciences & Heritage Resources

City of Hamilton Professional and Consultant Services Roster 2011-2012 (C12-06-10); Fruitland-Winona Secondary Plan Area Breeding Bird Survey, Hamilton, Ontario (Terrestrial Ecologist)

Conducted breeding bird surveys, including point count surveys, for Species at Risk. Surveys were conducted for Bobolink, Eastern Meadowlark, Barn Swallow, and Chimney Swift, using MNR or Ontario Breeding Bird Atlas protocols, as applicable.

City of Hamilton Professional and Consultant Services Roster 2011-2012 (C12-06-10); Scube Central, Scube East Parcel 'A', and Scube East Parcel 'B' Breeding Bird Surveys, Hamilton, Ontario (Terrestrial Ecologist)

Conducted breeding bird surveys, including point count surveys, for Species at Risk. Surveys were conducted for Bobolink, Eastern Meadowlark, Barn Swallow, and Chimney Swift, using MNR or Ontario Breeding Bird Atlas protocols, as applicable.

Species at Risk in Ontario*, Various Sites (Biologist)

Field experience with many Species at Risk including: Butternut, Blanding's turtle, Snapping Turtle, Eastern Hog-nosed Snake, Chimney Swift, Common Nighthawk, Bobolink, Least Bittern, Hooded Warbler, Acadian Flycatcher, Loggerhead Shrike, Canada Warbler and Golden-winged Warbler.

Ontario Ministry of Natural Resources*, London and Aylmer District, Ontario (Field Biologist / Ornithological Technician)

Scored wetlands within Aylmer District for the Ministry of Natural Resources using the Southern Ontario Wetland Evaluation System (3rd Edition) protocol. Work involved assessment of biological, social, hydrological and special features of wetlands in accordance with OWES, landowner liaison and planning of fieldwork. Created, edited, organized and managed data layers for Ontario wetlands, forests and urbanization using aerial photography, satellite imagery and ArcGIS software. Searched research plots for bird nests, collected field data on forest bird nesting success and plant characteristics using established techniques, managed data and created maps of research sites and nest locations using GIS software.

Bird Studies Canada*, Port Rowan, Ontario (Ornithological Technician)

Conducted bird and amphibian inventories for a wetland study using specified protocols. Reviewed background data and literature and wrote reports on population trends of colonial nesting tern species. Conducted forest bird inventories used in developing forestry management practices. Reported current bird sightings for the Bird Studies Canada web-site.

** denotes projects completed with other firms*

Don Graham M.Sc., B.Ed., B.A.

Ecologist

Residential Development

Various Residential Development Projects*, Ontario (Biologist)

Conducted terrestrial fieldwork and wrote terrestrial components of Environmental Impact Studies to support Residential Development projects in Ontario, including projects located in: Kawartha Lakes, Pickering, Holland Landing East, Holland Landing West, Sharon, Newmarket, Belleville, Peterborough, Aurora and Toronto.

** denotes projects completed with other firms*

Josh Mansell

Terrestrial Biologist

Josh Mansell is a Terrestrial Biologist, in the Environmental Services Group for Stantec Consulting Ltd. His academic background encompasses many aspects of environmental sciences and natural resource management with a focus towards aquatic and terrestrial biology. Mr. Mansell is certified in Ontario's Southern Ontario Wetland Evaluation System and is experienced in its field and reporting applications. He also has field experience in avian and amphibian identification through sight and sound and their associated habitats, as well as conducting extensive terrestrial and aquatic flora identification. Josh's expertise encompasses a healthy knowledge of Ontario's freshwater fish species, familiarity with the Natural Heritage Information Centre, Natural Heritage Reference Manual, Significant Wildlife Habitat Technical Guide, the Species at Risk Act, Endangered Species Act and Migratory Birds Convention Act, which aids in the analysis of natural heritage features to identify significance through Natural Heritage Assessments. Josh was the lead on a fisheries compensation project component that involved the design and creation of a coastal wetland along the St. Lawrence River for the purpose of creating and enhancing fisheries habitat where he was able to display his strong knowledge of the Fisheries Act and freshwater fisheries ecology. Also, he has experience in reporting findings for biological surveys, conducting the associated statistical analysis, preparing budgets and proposals.

EDUCATION

Ecosystems Management Technician, Sir Sandford Fleming College, Lindsay, Ontario, 2006

Fish and Wildlife Management Technologist, Sir Sandford Fleming College, Lindsay, Ontario, 2007

Ontario Wetland Evaluation System Certificate (Southern Region), Lindsay, Ontario, 2007

Fish Hatchery Operations Certificate, Lindsay, Ontario, 2007

Ice Safety/Rescue WOI Certificate (OMNR), Lindsay, Ontario, 2006

Winter GPS Mammal Tracking, Lindsay, Ontario, 2006

Ontario Fur Harvesters Certificate, Lindsay, Ontario, 2005

Fish and Wildlife Management Technician, Sir Sandford Fleming College, Lindsay, Ontario, 2005

OSAP Training Course/Electrofishing Certificate (Class 2), Kemptville, Ontario, 2010

MNR NHIC Training for SAR Management, Smiths Falls, Ontario, 2011

DFO Ontario Freshwater Mussel Identification Workshop, Finch, Ontario, 2010

ROM Fish Identification Certificate of Completion, Toronto, Ontario, 2010

PAL and Ontario Hunter Safety Certificate, Lindsay, Ontario, 2006

Chainsaw Training, Aylmer, Ontario, 2003

Ontario Drivers License (D Class)/Defensive Driving/Traffic Control, Toronto, Ontario, 2007

Level II Certified, Ontario Freshwater Fish Identification Course, Kemptville, Ontario, 2011

AED and CPR (C) Certificate of Completion, Ottawa, Ontario, 2011

MEMBERSHIPS

Voluntary Member, Bird Studies Canada

Voluntary Member, Ducks Unlimited

** denotes projects completed with other firms*

Josh Mansell

Terrestrial Biologist

PROJECT EXPERIENCE

Aquatic Ecology

Stream Monitoring and Assessment Research Team Eastern Region (SMARTER)*

The purpose of the SMARTER group was to collaborate with Eastern Ontario stream researchers that talked about study designs, funding opportunities, evolving legislation and techniques. As a member of the Ontario Stream Assessment Protocol (OSAP) Steering Committee new information regarding the protocol was presented to the team biannually; who most of which implemented the protocol at their respective agencies.

Created Wetlands

Port of Prescott Fish Habitat Compensaton Plan*, Morrisburg, Ontario

Involved with the initiation, coordination and design of a coastal wetland along the St. Lawrence River for the purpose of creating fish habitat. Required to construct an extensive monitoring plan that involved aspects of terrestrial and aquatic biology for pre and post-construction monitoring. Led the process of actively searching and selecting an engineering firm to construct professional CAD drawings of the proposed wetland.

Fisheries Management

Ontario Graphite Ltd.,, Kearney, Ontario (Terrestrial Biologist)

A simple fisheries investigation in remote locations was conducted to determine the current fisheries community within various waterbodies and watercourses in the study area. Orienteering and backpacking were large components of this project.

City of Ottawa Slope Stabilization Project, Carp, Ontario (Terrestrial Biologist)

Josh provided a detailed description of the existing fisheries communities and habitat to the city for this project.

Windsor Park Village Environmental Inventory, Finch, Ontario (Terrestrial Biologist)

A simple fisheries investigation was conducted to determine the current fisheries community within the watercourse

Ottawa 300 Development, Lindsay, Ontario (Terrestrial Biologist)

Fisheries investigations were also employed by Josh for this project. Fisheries communities and habitat were identified and described.

Liffey Creek, arnprior, Ontario (Terrestrial Biologist)

Josh completed a fish rescue for the Township of Braeside-McNab in order for them to install a new culvert. Identification skills were a necessity because of identified SAR in the area.

Kemptville Commercial EIS, Kemptville, Ontario (Terrestrial Biologist)

Josh was involved with several fish and fish habitat components for this project. Identifying and describing the fisheries communities within several watercourses were a major component.

MTO Highway 7 & 35, Lindsay, Ontario (Terrestrial Biologist)

A detailed fisheries community and habitat assessment was conducted along several watercourse crossings for this project using specific MTO guidelines.

City of Ottawa Campeau Drive, Kanata, Ontario (Terrestrial Biologist)

Josh was involved with several fish and fish habitat components for this project. Identifying and describing the fisheries communities within the Carp River were a major component.

Lake Ontario Atlantic Salmon Reintroduction Program* (Hatchery Technician)

Volunteered my services to the Lake Ontario Atlantic Salmon Reintroduction Program at Fleming College's Frost Campus fish hatchery. Enough hours were accumulated to obtain a Fish Hatchery Operations Certificate. Experience with Muskellunge at the hatchery was also obtained in previous years.

** denotes projects completed with other firms*

Josh Mansell

Terrestrial Biologist

South Nation Conservation* (Fisheries Technician)
As a technician I had the responsibility of initiating, coordinating and implementing a stream fisheries monitoring project watershed wide. The Ontario Stream Assessment Protocol (OSAP) was conducted on various streams in outlined subwatersheds to obtain baseline data that is used to perform multiple restoration projects, fulfill data requests and update the municipal drain database. Morphological, chemistry and biological data was gathered during each sampling event. The Near Shore Community Index Netting (NSCIN) protocol was also conducted on the larger rivers of the watershed where important fisheries data was collected that was used to create a fisheries management plan for the watershed. Various other projects that were conducted involved species at risk management; including a rare turtle study, butternut and ginseng surveys and cutlip minnow sampling.

Forestry Services

Ontario Ministry of Natural Resources*, Aylmer, Ontario (Internship)
Collaborated with Elgin/Oxford/Middlesex Counties Stewardship Councils to assist with the Ministry of Resources' Forests for Life program, where it was required to secure native seed stocks for plantings on private land. An important role was to engage landowners and interact with them daily on the Stewardship Councils roles and projects.

Stream Rehabilitation

Catfish Creek Conservation Authority*, Aylmer, Ontario (Internship)
Involved with various stewardship projects in the watershed
Responsible for students of the Environmental Leadership Program
Aided with stream remediation projects to improve habitat

Tree Preservation & Assessment

Davey Tree Expert* (Arborist/Crew Leader)
Many aspects of this position involved the identification of tree species, tree health and tree maintenance at an advanced level to comply with clients requests. Understanding the ecology of various tree species was integral to the successful completion of many of the projects.

Wetland Restoration and Mitigation

Yarmouth Natural Heritage Area Wetland Restoration*, Aylmer, Ontario
The Yarmouth Natural Heritage Area was historically a wetland that was drained for agricultural purposes and was designated to be restored to its natural function after the it was retired. Duties included the initial consultation and field visits to the site. Surveying, species identification and basin delineation were involved with the initial visits. GIS services were also provided, creating a map of the area with different polygons that outlined the distinct vegetation communities, habitat features and project area.

Wildlife Biology

City of Ottawa East Pool SAR Study, Orleans, Ontario (Terrestrial Biologist)
A Bobolink habitat survey was completed in conjunction with a dedicated Bobolink transect survey.

Windsor Park Village Environmental Inventory, Ottawa, Ontario (Terrestrial Biologist)
A complete environmental inventory of a National Capital Commission (NCC) property was conducted using the BBS protocol, MMP's amphibian monitoring protocol, Butternut transect survey and also a complete vegetation inventory was collected. Knowledge of provincially significant natural features and federally significant species was essential.

Ottawa 300 Development, Lindsay, Ontario (Terrestrial Biologist)
Josh implemented three rounds of the MMP's amphibian survey and two rounds of the BBS.

MTO Highway 7 & 35, Lindsay, Ontario (Terrestrial Biologist)
The ELC protocol was implemented using MTO's specific terrestrial assessment guidelines outlined. An emphasis was also placed on the identification of bird nests within culverts and bridges of the watercourse crossings.

Kemptville Commercial EIS, Kemptville, Ontario (Terrestrial Biologist)
Familiarity with the local municipal official plan and provincial guidelines, with respect to significant natural features, was necessary for this project. Josh was involved with the ELC and habitat characterization components for this project.

** denotes projects completed with other firms*

Josh Mansell

Terrestrial Biologist

Highway 7 Service Road EA Update, Stittsville, Ontario (Terrestrial Biologist)
Several SAR surveys and protocols were implemented in this project. They include active searching for Blanding's and Spotted Turtles, Environment Canada's Least Bittern survey protocol and Butternut and Ginseng transect surveys. Reporting on the findings and describing SAR habitat was important.

David Brown Solar Project, Ingleside, Ontario (Terrestrial Biologist)
Identifying and describing watercourses, waterbodies and wetlands with respect to the Renewable Energy Act (REA) were the main focus of this project. Wetlands were identified and delineated using the OWES protocol and vegetation communities were described using the ELC protocol.

Campeau Drive, Kanata, Ontario (Terrestrial Biologist)
Two rounds of the BBS were carried out within the project area, as well as, the ELC protocol.

Ashcroft Homes East Urban Community, Orleans, Ontario (Terrestrial Biologist)
Prior to development a series of surveys were conducted to determine the presence or absence of Species at Risk (SAR). A thorough Butternut survey was conducted by walking transects through potential habitat within the project area. Recommendations were given to the client concerning Butternut and associated municipal and provincial regulations. A dedicated Bobolink transect and point count survey was also implemented using the MNR's draft Bobolink survey methodology.

Amherst Island Proposed Wind Farm, Stella, Ontario (Terrestrial Biologist)
Various avian surveys were conducted throughout the year, including: fall passerine transects, fall and winter raptor and waterfowl surveys and Short-eared Owl Surveys. ELC was also conducted in certain locations on the island.

Wolfe Island Wind Farm, Marysville, Ontario (Terrestrial Biologist)
Various avian surveys were conducted throughout the year, including: marsh monitoring protocol, winter raptor surveys, Short-eared Owl surveys and bi-weekly aerial waterfowl surveys.

Almonte Solar Project, Almonte, Ontario (Terrestrial Biologist)
Josh conducted several rounds of the Breeding Bird Survey (BBS) while implementing a protocol specifically targeting Bobolink, Eastern Meadowlark and Barn Swallow. Also, he was involved with wetland delineation and characterizing vegetation communities using the Ontario Wetland Evaluation System (OWES) and the Ecological Land Classification (ELC) protocol.

Bird Studies Canada/Toronto Region Conservation Authority* (Avian Specialist)
This project was conducted on behalf of Bird Studies Canada (BSC) and the Toronto Region Conservation Authority (TRCA) to perform BSC's Marsh Monitoring Protocol that targets specific sensitive marsh birds along Lake Ontario's large coastal wetlands. Though these sensitive species were the primary target it was equally as important to have knowledge of all avian marsh species to record incidental occurrences. Breeding bird surveys were also a component of this position.

Algonquin Park Eastern Wolf Study* (Researcher)
Provided assistance to the lead researcher and research team when conducting various duties to determine the prey preference of Algonquin Park's wolves. GPS telemetry was a major component of this study to determine where wolves captured their prey and the species of prey. Deer, Moose and Wolf ecology knowledge was important to understand in order to accomplish the scope of the study. Winter identification of forest trees and shrubs was also a necessity to complete the required vegetation survey plots to determine the amount of deer and moose browse around the specific sites.

Herptile Marsh Monitoring Tommy Thompson Park*, Toronto (Researcher)
Involved with the ongoing monitoring of Tommy Thompson Parks' Herptile population by performing the Marsh Monitoring Protocols' amphibian survey at various locations throughout the park. Extensive knowledge of Ontario's amphibian vocalizations were required to accurately complete the surveys throughout the summer.

** denotes projects completed with other firms*

Josh Mansell

Terrestrial Biologist

Tommy Thompson Bird Research Station*, Toronto (Researcher)

Volunteered in a citizen science program that identified and banded migrating land birds at a provincial bird banding research station in Toronto. Avian identification and ecology knowledge was provided to perform various seasonal components including census point counts, handling of birds and banding of birds.

** denotes projects completed with other firms*

Matthew Ross B.Sc.

Ecologist

Matthew Ross is an ecologist whose skills include bird, mammal, reptile and plant identification. He is adept at conducting wildlife and wildlife habitat surveys, including those that relate to environmental assessment, conservation and species at risk. Matthew is familiar with provincial and federal guidlines, including Ontario Wetland Evaluation System (OWES), Ecological Land Classification (ELC) and Renewable Energy Approvals (REA). He has conducted surveys for a variety of development projects, including renewable energy, aggregate extraction and residential, and has work experience in both the public and private sector. In addition, Matthew is familiar with wildlife handling, including bird banding and migration monitoring at Selkirk Provincial Park. He has performed native tree species plantings and been involved in exotic plant control efforts as a volunteer at Florida Panther National Wildlife Refuge.

EDUCATION

B.Sc., University of Northern British Columbia / Natural Resources Management Wildlife and Fisheries, Prince George, British Columbia, 2007

Sir Sandford Fleming College / Fish and Wildlife Technologist, Lindsay, Ontario, 2004

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Kemptville, Ontario, 2011

Certificate, Stantec Consulting Ltd. / WHMIS, Guelph, Ontario, 2011

PROJECT EXPERIENCE

Aggregate Services

Proposed Melancthon Quarry, Melancthon, Ontario (Terrestrial Technician)

Conducted habitat assessment and species at risk surveys and performed reporting

Multi-Unit / Family Residential

Clair Creek Meadows, Waterloo, Ontario (Terrestrial Technician)

Matthew conducted an assessment of silt fence integrity

Hammersley, Cambridge, Ontario (Terrestrial Technician)

Conducted snake cover board and amphibian surveys

Buffalo Springs Residential Development, Ontario (Terrestrial Technician)

Matthew conducted habitat assessment and species at risk surveys, and performed project reporting

Natural Sciences & Heritage Resources

Nova 2020 Plant Expansion Project, Corunna, Ontario (Terrestrial Technician)

Conducted snake cover board and amphibian surveys

Woodland Bird Nest Surveys, Ontario Ministry of Natural Resources (MNR), 2006* (Avian Nest Biologist)

Matthew performed surveys that involved finding and monitoring woodland bird nests in southern Ontario, including species at risk, radio tracking and identifying fledgling birds, as well as associated vegetation surveys

Wildlife and Habitat Surveys, 2009* (Biologist)

While working for a private consulting firm, Matthew carried out various wildlife and habitat surveys for several energy related projects, including wind farm mortality monitoring, breeding bird surveys, amphibian, reptile and mammal surveys. He also conducted scientific literature research and data entry, as well as assisted in writing project proposals and presentation to clients

Various Development Projects, 2007, 2008, 2010* (Biologist)

While working for a private consulting firm, Matthew conducted biological field surveys and associated data management and analysis for various developments throughout Ontario and other provinces, including renewable energy. These involved breeding bird surveys, nest searches, amphibian counts, salamander population monitoring for species at risk, wind farm mortality monitoring, bat species and abundance monitoring and wetland evaluation. He also conducted associated research and assisted in reporting

** denotes projects completed with other firms*

Matthew Ross B.Sc.

Ecologist

Oil and Gas Pipelines

TransCanada Pipelines Ltd., Eastern Mainline Expansion, Ontario (Terrestrial Technician)
Conducted species at risk breeding bird surveys

Enbridge Integrity Dig Program, Ontario (Terrestrial Technician)
Conducted nesting bird surveys and nest monitoring surveys

Trans-Northern Pipelines Inc., Bronte Creek Risk Assessment, Burlington, Ontario (Terrestrial Technician)
Assisted in conducting an initial site assessment and salamander egg mass survey

Nova Chemicals Genesis Pipeline Extension, Corunna, Ontario (Terrestrial Technician)
Conducted snake cover board and amphibian surveys

St. Clair Pipelines Bluewater River Crossing Replacement, Corunna, Ontario (Terrestrial Technician)
Conducted snake cover board and amphibian surveys

Post-Construction

Victoria Park, Kitchener, Ontario (Terrestrial Technician)
Conducted post-construction migratory waterfowl, botanical inventory and replanting monitoring surveys

Renewable Energy

Solray Renewable Solar Energy Project, Ontario (Terrestrial Technician)
Conducted due diligence site assessment with client to identify project constraints and assisted in reporting

Various Renewable Wind Energy Projects, Ontario (Terrestrial Technician)
Conducted ELC, amphibian, migratory passerine, waterfowl, raptor and crepuscular bird auditory surveys, species at risk habitat assessment and surveys, amphibian surveys, post-construction monitoring, and assisted with technical reporting for various wind energy projects, including Wolfe Island Wind Farm, Ameherst Island Wind Farm, White Pines Wind Farm, Niagara Region Wind Centre, Bow Lake Wind Farm, K2 Wind Project, Cedar Point Wind Project, and Dorland Wind Project

Roads and Highways

Detail Design for the Rehabilitation of Highway 6/10 from Chatsworth to Owen Sound, Grey County, Ontario (Terrestrial Technician)
This study included a 15 km stretch of highway through several significant natural habitat features, including the Niagara Escarpment, Life Science ANSI, unevaluated wetlands, and large continuous tracts of mature forest and riparian habitat. Matt's responsibilities on this assignment included Ecological Land Classification, bird surveys and surveys for species at risk, documentation of wildlife species and habitat, and mapping of birds' nests

** denotes projects completed with other firms*

Cheryl-Anne L. Ross B.Sc., Tech. Dipl.

Terrestrial Ecologist

Cheryl-Anne Ross is a terrestrial ecologist whose skills include bird, mammal, herpetile, and plant identification, with technical experience in both the public and private sectors. Cheryl-Anne is certified in Ecological Land Classification (ELC). She is adept at conducting a variety of wildlife and wildlife habitat surveys, and has been involved development projects in various sectors, including renewable energy (wind) planning, residential, and industrial construction.

EDUCATION

B.Sc., University of Northern British Columbia / Natural Resources and Environmental Management, Wildlife and Fisheries, Prince George, British Columbia, 2007

Tech. Dipl., Sir Sandford Fleming College / Fish and Wildlife Technologist, Lindsay, Ontario, 2004

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC), Lindsay, Ontario, 2011

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Various Development Projects*, Ontario (Terrestrial Ecologist & Wetland Biologist)

Conducted biological field surveys and associated data management and analysis for various developments throughout Ontario, including renewable energy projects. Included were breeding bird surveys, nest searches, amphibian counts, SAR salamander population monitoring, wind farm mortality monitoring, bat species and abundance monitoring, and wetland evaluation. Also involved associated background research and reporting

NOVA Chemicals Genesis Pipeline Extension, Corunna, Ontario (Terrestrial Ecologist)

Conducted SAR surveys and habitat assessments, including reptile (snake) coverboard surveys and amphibian (frog) call count surveys

Amherst Island Wind Farm, Amherst Island, Ontario (Terrestrial Ecologist)

Conducted winter raptor, staging waterfowl, and SAR surveys; provided assistance with technical reporting and data entry

Waterloo Westside, Vista Hills, Clair Creek Meadows, Waterloo, Ontario (Terrestrial Ecologist)

Conducted an assessment of silt fence integrity and photo-monitoring; assessed impacts of deleterious substance release

NOVA 2020 Plant Expansion, Corunna, Ontario (Terrestrial Ecologist)

Conducted SAR surveys and habitat assessments, including reptile (snake) coverboard and amphibian (frog) call count surveys

Cedar Point Wind Farm, Forest, Ontario (Terrestrial Ecologist)

Conducted habitat assessment, ELC, SAR surveys including reptile (snake) coverboard surveys

Niagara Region Wind Centre, Niagara Peninsula, Ontario (Terrestrial Ecologist)

Conducted habitat assessment, ELC, amphibian surveys, winter raptor surveys, and SAR surveys; aided with coordination of field studies and assisted with technical reporting for the Natural Heritage Assessment

Bow Lake Wind Farm, Montreal River Harbour, Ontario (Terrestrial Ecologist)

Conducted habitat assessment, amphibian surveys, and SAR surveys; aided in coordination of field studies and assisted with technical reporting for the Natural Heritage Assessment

** denotes projects completed with other firms*

Nicole Charlton B.A.

Botanist / Terrestrial Ecologist

Nicole Charlton is a terrestrial ecologist whose primary expertise is in field botany, with particular experience in conducting floral inventories, Ecological Land Classification (ELC), and terrestrial vegetation monitoring. She has also assisted on a wide variety of wildlife surveys, including amphibian monitoring, anuran call counts, reptile and mammal surveys, and bird and bat mortality studies. Nicole has technical experience in both the public and private sectors, and has experience working on a wide variety of projects, including invasive species control and land stewardship, ecological monitoring, various Species at Risk (SAR) surveys, surveys for renewable energy (wind) development planning and monitoring, in addition to other types of development projects.

EDUCATION

B.A., University of Guelph / Geography, Guelph, Ontario, 2010

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Lindsay, Ontario, 2011

Stantec Consulting Ltd. / WHMIS Training, Guelph, Ontario, 2011

PROJECT EXPERIENCE

Cement / Aggregates

Proposed Melancthon Quarry, The Highland Companies, Melancthon, Ontario (Terrestrial Ecologist)
Assisted with electrofishing and habitat assessment studies in support of the natural heritage technical report

Proposed Flamborough Quarry, Flamborough, Ontario (Terrestrial Ecologist)
Assisted with Butternut Health Assessment on subject lands in support of the natural heritage technical report

Walker Aggregates Inc. Duntroon Quarry Expansion, Duntroon, Ontario (Terrestrial Ecologist)
Assisted with monitoring sensitive species populations (American Hart's-tongue Fern), in support of the natural heritage technical report

Natural Sciences & Heritage Resources

Ecological Surveys for Various Residential Developments, Ontario (Terrestrial Ecologist)
Assisted on various ecological surveys in support of development applications, including anuran monitoring, ELC, and floral inventories

Terrestrial Vegetation Monitoring, Credit Valley Conservation*, Mississauga, Ontario (Terrestrial Monitoring Crew Leader)
Led a team and carried out vegetation monitoring according to EMAN and Credit Valley Conservation protocols in riparian, wetland, and forest habitats, as well as an in-house tree health component. Work included multi-season systematic inventory and identification of vegetation species in permanent plots at sites throughout the Credit River watershed

Natural Heritage Conservation, Credit Valley Conservation*, Ontario (Natural Heritage Assistant)
Performed a variety of tasks related to natural heritage conservation, including ELC; native seed collection and plant propagation as part of the restoration of the Rattray Marsh forest communities; field trials of invasive species control methods for common buckthorn and garlic mustard, as well as landowner liaison regarding invasive species and land stewardship issues; assisted with writing various reports and in-house research material

Invasive Species Control, Asian Long-horned Beetle Taskforce, Canadian Food Inspection Agency*, Greater Toronto Area (GTA), Ontario (Plant Protection Inspector)
Systematically inspected host tree genera across the regulated portion of the GTA for evidence of infestation by Asian Long-horned Beetle

** denotes projects completed with other firms*

Nicole Charlton B.A.

Botanist / Terrestrial Ecologist

Renewable Energy

Wind Energy Projects, Various Sites, Ontario (Terrestrial Ecologist)

Conducted ELC, amphibian, reptile, raptor, and Short-eared Owl surveys, post-construction monitoring, and assisted with technical reporting for various wind energy projects, including Wolfe Island Wind Farm, Amherst Island Wind Farm, White Pines Wind Farm, Niagara Region Wind Centre, Kingsbridge Wind Farm, Grand Renewable Energy Project

** denotes projects completed with other firms*

Alan Wormington Tech. Dipl.

Ornithologist

Alan Wormington is an ornithologist with extensive experience in conducting avian surveys, data analysis and reporting. Alan has served as a researcher, data collector, contributing author and editor for a variety of technical journals, books, newspapers and newsletters, writing articles pertaining to the biological sciences, specifically with regard to birds, butterflies and moths, and natural history. He is a founding member and member of various birding and field naturalist associations, and has conducted interpretive birding tours for various groups in Ontario and other provinces of Canada, various states in the USA, and Mexico. Over the years Alan has provided technical field skills to both private and public organizations, including various environmental consultancies, the Ontario Ministry of Natural Resources, and Parks Canada.

Alan has provided technical support on contract to Stantec Consulting for various renewable energy wind power projects, primarily performing seasonal avian surveys at various project sites throughout Ontario. A brief summary of Alan's projects is listed below.

EDUCATION

Tech. Dipl., Seneca College / Historical/Natural Interpretive Services, Toronto, Ontario, 1979

Tech. Dipl., Sheridan College of Applied Arts and Technology / Applied Photography, Oakville, Ontario, 1976

MEMBERSHIPS & VOLUNTARY SERVICE

Voting Member (2011), Ontario Bird Records Committee (Ontario Field Ornithologists)

Associate Editor (2011), North American Birds Journal (American Birding Association)

Volunteer (1978-2010), Point Pelee volunteer compiler of bird observations for the North American Birds Journal (American Birding Association)

PROJECT EXPERIENCE

Renewable Energy

Mica Bay Wind Power Project, Ontario (Field Technician)
Conducted avian field surveys in northern Ontario as part of the pre-construction monitoring.

Amherst Island Wind Power Project, Amherst Island, Ontario (Field Technician)
Conducted avian field surveys for breeding birds including species at risk.

Port Alma Wind Power Project, Municipality of Chatham-Kent, Ontario (Field Technician)
Conducted avian field surveys as port of the Post-construction disturbance monitoring.

Natural Sciences & Heritage Resources

Seasonal Avian Surveys for a Private Consultancy*, Various Sites, Canada (1973, 2001) (Biologist)
Performed wildlife surveys in the Yukon and Northwest Territories to assess environmental impacts of the proposed Mackenzie Valley Oil Pipeline

Seasonal Data Collection and Analysis at the Lake Erie Fisheries Research Station for the Ministry of Natural Resources*, Ontario (1987-1997) (Resource Technician)
Responsible for field collection and lab analysis of various samples, including fish, water, zooplankton, and Zebra Mussels

Seasonal Avian Surveys and Reporting for Southpoint Wind Ontario Limited*, Leamington, Ontario (2009) (Consultant)
Extensive avian surveys of spring and fall migration for wind turbine projects proposed for offshore waters of Lake Erie

** denotes projects completed with other firms*

Alan Wormington Tech. Dipl.

Ornithologist

Seasonal Avian Surveys for a Private Consultancy*, Various Sites, Ontario (2003-2010) (Consultant)
Performed various assessments of breeding birds and their habitats for multiple construction projects, including those associated with highways, bridges, railway corridors, and wind turbine projects

Seasonal Avian Surveys and Reporting for Wind Projects Incorporated*, Milton, Ontario (2007-2008) (Consultant)
Completed a comprehensive assessment of bird populations for the Oxley Wind Farm, Essex, as part of the environmental review process; bird surveys conducted included winter, spring migration, summer breeding, and fall raptor migration

Expert Review of Species at Risk Documents for Point Pelee National Park*, Leamington, Ontario (2006-2008) (Consultant)
Performed expert review of various documents related to species at risk

Seasonal Avian Surveys and Reporting for Point Pelee National Park*, Leamington, Ontario (2005) (Consultant)
Intensive breeding bird survey conducted, and completion of 'The Breeding Birds of Point Pelee National Park, with an Emphasis on Species at Risk' (77 page report)

Seasonal Avian Surveys and Reporting for Various Private Consultancies*, Various Sites, Ontario (1984, 1986, 2000-2004) (Consultant)
Completed specific, short-term projects that generally involved intensive biological fieldwork at a site, followed by writing and submission of a report, often pertaining to environmental assessments in advance of proposed development projects

Seasonal Avian Surveys and Reporting for Joint Study*, Gulf of Mexico (1999-2000) (Ornithologist)
Three seasons (fall / spring / fall) avian studies for the "Migration-Over-The-Gulf Project", a joint study by Louisiana State University (Baton Rouge, LA) and Minerals Management Service (US Department of Interior). Stationed on offshore oil platforms to study the migration of birds crossing the Gulf of Mexico

Seasonal Avian Surveys for a Private Consultancy*, Various Sites, Ontario (2007, 2008) (Field Scientist)
Conducted seasonal avian surveys for various wind power projects in Essex, Chatham-Kent, and Lambton, Ontario. Field survey types included point counts for spring and fall migration and breeding birds, roadside surveys for waterfowl and shorebird staging, and fall migration studies for raptors

Seasonal Avian Survey and Reporting for Ivory-billed Woodpecker Joint Study*, Louisiana, USA (2002) (Ornithologist)
Expert birder in search of Ivory-billed Woodpecker in southeast Louisiana for a joint project of Zeiss Optics Inc., Louisiana State University (Baton Rouge, LA), and Louisiana Department of Natural Resources

Wildlife Habitat Assessment Project for the Ministry of Natural Resources*, Various Sites, Ontario (1990) (Field Crew Biologist)
Served as field crew biologist for the Wildlife Habitat Assessment Project on Hudson Bay and James Bay

Ontario Wetland Identification Program for the Ministry of Natural Resources*, Chatham, Ontario (1985) (Wetlands Crew Leader)
Served as wetlands crew leader for the provincial wetland identification program

Seasonal Expert Birder on Occasion for Two National and Provincial Parks*, Various Sites, Ontario (1978-2005) (Expert Birder)
1978-1982, 1999-2002, 2004-2005 – Point Pelee Provincial Park
2003 – Rondeau Provincial Park

Environmentally Significant Areas Projects*, Various Sites, Ontario (1976-2004) (Field Biologist)
Gathered life science information for designated natural areas and, in most cases, submitted reports, which generally spanned the period of April to September, inclusive:
2003-2004 – Halton Region (Conservation Halton)
2001-2002 – Hamilton Region (Hamilton CA)
1991 – Hamilton Region (Hamilton Naturalists Club
1986 – Kent/Elgin Counties (World Wildlife Canada)
1977 – North Wellington County (University of Guelph, Centre for Resources Development)
1976 – Hamilton Region (Hamilton Region CA)

** denotes projects completed with other firms*

Pete Read Hons. B.Sc. Zoology/Ecology, B.Ed. (UWO)

Biologist

Pete Read is a knowledgeable biologist and project manager with a wealth of experience in both the public and private sector, conducting various faunal surveys throughout Ontario. Since 1975 he has organized, coordinated, and participated as a volunteer in notable bird-related projects, organizations, atlases and committees, and field naturalist groups, where he has honed and shared his field skills and knowledge of natural heritage resources in Ontario and elsewhere. Pete is an expert birder, and has served as an expert interpreter and group leader for various wildlife tours within Ontario and outside Canada. Pete is knowledgeable about bird species at risk, and has consulted, designed and constructed enclosures for the Loggerhead Shrike, as well as collected nest records, performed habitat studies, banding, and blood sampling of Acadian Flycatchers for a research program in southwestern Ontario. He has a great deal of experience conducting various types of avifaunal survey programs for wind turbine projects throughout Ontario. Pete has also served as crew leader for boreal bird inventories for a joint study in various locations of northwestern Ontario, where he was responsible for programming and logistics, including coordination of communications with stakeholders, including First Nations representatives.

Pete has provided technical support on contract to Stantec Consulting for various projects, primarily performing seasonal avian surveys, including spring and autumn raptor and migratory bird surveys, waterfowl, amphibian, and other wildlife surveys, at various project sites throughout Ontario. In addition to collecting data in the field, Pete has provided data analysis and reporting services to Stantec in support of several of our projects, including wind farm planning and post-construction monitoring projects. A brief summary of his recent projects is listed below.

EDUCATION

Hons. B.Sc. Zoology/Ecology, B.Ed. / University of Western Ontario, London, Ontario

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Wind Turbine Projects*, Various Sites, Ontario (2006-2010) (Biologist)

Performed faunal studies, including avian location, migration, and roadside surveys, for wind turbine projects in Middlesex, Bruce, Grey, Haldimand and Norfolk, Chatham-Kent, Lampton, Dover, Amherstberg.

Loggerhead Shrike Recovery Program for Wildlife Preservation Canada and Canadian Wildlife Service, and Metropolitan Toronto Zoo*, Toronto, Ontario (2004-2010) (Biologist)

Designed and constructed enclosures, and provided ongoing consulting services for the Loggerhead Shrike, an avian species at risk.

Friends of Point Pelee, Point Pelee National Park*, Ontario (2001-2010) (Biologist)

Served seasonally as 'expert' bird hike leader at Point Pelee National Park, a popular birding destination due to its diversity of avifauna.

Woodlot Faunal Surveys*, Various Sites, Ontario (2009) (Biologist)

Performed faunal surveys in 37 woodlots in Tecumseh, Essex County.

Boreal Bird Inventories for Federation of Ontario Naturalists (Ontario Nature), Boreal Initiative, and Atlas of Breeding Birds Joint Study*, Various Sites, Ontario (2004-2005) (Biologist)

Served as field crew leader, and was in charge of program, logistics, and communications with stakeholders, including First Nations representatives.

Location, Habitat, and Point Count Bird Surveys for Atlas of Breeding Birds of Ontario*, Various Sites, Ontario (2005) (Biologist)

Served as field crew leader for location, habitat, and point count bird surveys in area near Algonquin Provincial Park.

** denotes projects completed with other firms*

Pete Read Hons. B.Sc. Zoology/Ecology, B.Ed. (UWO)

Biologist

Acadian Flycatcher Research Program*, Various Sites, Ontario (2004) (Biologist)
Collected nest records, performed habitat studies, banding, blood sampling of Acadian Flycatchers, a species at risk, for a research program run by Dr. Bonnie Wolfenden, York University.

Location, Habitat, and Point Count Bird Surveys for Atlas of Breeding Birds of Ontario*, Various Sites, Ontario (2003) (Biologist)
Performed location, habitat, and point count bird surveys in area near Temagami, North Bay, Sudbury regions.

Faunal Surveys for Nature Conservancy Canada*, Various Sites, Ontario (2002) (Biologist)
Performed faunal surveys at Clear Creek, Chatham-Kent.

Faunal Surveys for Ontario Ministry of Natural Resources*, Various Sites, Ontario (2002) (Biologist)
Performed faunal surveys at Bickford Oak Woods, Lambton.

Amphibian Surveys*, Ontario (2002) (Biologist)
Performed amphibian surveys at Komoka Provincial Park Reserve.

Acadian Flycatcher and Hooded Warbler Surveys for Canadian Wildlife Service*, Various Sites, Ontario (2000, 2002) (Biologist)
Performed surveys for Acadian Flycatcher and Hooded Warbler, species at risk, at southwestern Ontario core sites.

Acadian Flycatcher Habitat Assessment and Nest Productivity for Canadian Wildlife Service and Ontario Ministry of Natural Resources*, Various Sites, Ontario (2001) (Biologist)
Performed habitat assessment and nest productivity studies for Acadian Flycatcher, a species at risk.

Faunal Surveys, Komoka Provincial Park*, Ontario (2001) (Biologist)
Performed faunal surveys for Komoka Provincial Park.

Acadian Flycatcher Surveys for Bird Studies Canada*, Various Sites, Ontario (1999) (Biologist)
Performed searches for Acadian Flycatchers, a species at risk, at ravine and upland forest sites in Elgin, Middlesex, and Lambton Counties.

Acadian Flycatcher, Hooded Warbler, and Other Species at Risk Breeding Bird Surveys for Bird Studies Canada, Canadian Wildlife Service, World Wildlife Fund Canada*, Various Sites, Ontario (1998) (Biologist)
Searched for breeding Acadian Flycatcher, Hooded Warbler and other species at risk, at known sites in southwestern Ontario, and noted habitat features at breeding territories.

Acadian Flycatcher, Hooded Warbler, Prothonotary Warbler, and Other Species at Risk Breeding Bird Surveys for Bird Studies Canada, Canadian Wildlife Service, World Wildlife Fund Canada*, Various Sites, Ontario (1997) (Biologist)
Searched for breeding Acadian Flycatcher, Hooded Warbler, Prothonotary Warbler and other species at risk, at known sites in southwestern Ontario, and noted habitat features at breeding territories.

** denotes projects completed with other firms*

Zoé Lebrun-Southcott B.Sc. (Hons.), M.Sc.

Biologist / Ecologist

Zoé Lebrun-Southcott is a biologist with experience in the field of avian research and conservation. She has extensive experience in avian research methods, including point counts, nest searching and nest monitoring, territory mapping, habitat assessment, banding, mist net extraction, radio-transmitter and geolocator attachment, and is proficient at navigation, data collection and analyses using GPS and GIS technologies. Zoé has been involved in recovery efforts and research pertaining to avian Species at Risk in Ontario and beyond, with over five years' experience working in the field of avian conservation in North America, contributing to research, recovery, and policy initiatives. She has facilitated multi-partner projects, working with private landowners, and has coordinated volunteer projects. Additionally, Zoé has managed and coordinated field projects, including reviewing protocols and the training and supervision of field staff.

Zoe has provided technical support on contract to Stantec Consulting for various projects, primarily performing seasonal avian surveys, including spring and autumn raptor and migratory bird surveys, waterfowl, amphibian, and other wildlife surveys, at various project sites throughout Ontario. A brief summary of her recent projects is listed below.

EDUCATION

M.Sc., York University / Environmental Studies, Toronto, Ontario, 2005

B.Sc. (Hons.), McMaster University / Biology (Major) / Biochemistry (Minor), Hamilton, Ontario, 2002

AWARDS

2003 York University Graduate Assistantship ($6000)

1998 McMaster University Scholar Award ($3000)

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Eastern Loggerhead Shrike Program, Wildlife Preservation Canada*, Ontario (2010-2011) (Biologist)
Prepared 2010 Eastern Loggerhead Shrike (ELOSH) Recovery Program end-of-season reports for Environment Canada. Performed banding data entry and management, reviewed field data and necropsies for all deaths of adult and juvenile shrikes in the captive breeding program since 2005; prepared and organized data, graphs and additional information for analysis by an epidemiologist. Interviewed and selected field staff. Assisted the species recovery biologist with additional program activities and field season preparation

Research, Data Collection and Analysis, Reporting, and Handling of Avian Species at Risk (SAR) for Canadian Wildlife Service*, Various Sites, Ontario (2011) (Contract Biologist)
Conducted research on Bank Swallows, Barn Swallows, and Whip-poor-wills in the Guelph, Ontario area. Data collection and analysis included monitoring of colony size, disturbance, and nest occupancy of Bank Swallows in various sand and gravel pits and along Saugeen River. Monitoring nest productivity included monitoring nest contents of a subset of burrows in accessible colonies. Monitoring reproductive success of Barn Swallows in 15 barns in Wellington County included banding of nestlings and adults, mist-netting, and attachment of geolocators. Assisted with attachment of geolocators onto Whip-poor-wills in the Long Point area

Tundra-nesting Bird Monitoring for Wildlife Conservation Society*, Alaska, USA (2010) (Crew Leader)
Led the 2010 nest monitoring research project on tundra-nesting birds in the Prudhoe Bay region of Alaska. Established study plots and nest searched for all species using rope dragging and single-person searching techniques; floated eggs to determine hatch dates and monitored nest success. Collected habitat data at nest sites and examined nests for egg fragments to confirm successful hatch or predation. Set up remote cameras at select nests to record any predation events and activity. Performed data entry and management

** denotes projects completed with other firms*

Zoé Lebrun-Southcott B.Sc. (Hons.), M.Sc.
Biologist / Ecologist

Eastern Loggerhead Shrike Research on Carden Plain*, Ontario (2008-2010) (Biologist)
Supervised a small team of field staff and coordinated all Eastern Loggerhead Shrike monitoring for both wild population and captive breeding activities at the Carden field site. Surveyed for wild pairs and collected nesting and productivity data during two breeding seasons. Conducted point counts, juvenile captive shrike banding and attachment of radio-transmitters and geolocators. Managed communications with private landowners and collaborated on habitat stewardship initiatives. Produced monthly and end-of-season reports for both wild and captive shrike programs, and aided with review of protocols and field season preparation of materials for field staff. Aided with interviewing, hiring, and training of field staff. Developed an 'Adopt-a-site' volunteer survey program

Eastern Loggerhead Shrike Surveys for Environment Canada*, Various Sites, Ontario (2008) (Biologist)
Collected nest site data at known and accessible nesting sites, including habitat characteristics and micro-habitat vegetation data. Data entry, management and analysis from field data collected. Prepared a final report with results and recommendations for refining the data collection protocol for future use

Avian Species Studies on Private Ranches for Texas A&M University*, Texas, USA (2007) (Biologist)
Conducted point count surveys for all avian species on private ranches in central Texas. Surveyed for endangered Golden-cheeked Warblers and Black-capped Vireos using audio playbacks; located and monitored nests of White-eyed Vireos and Black-capped Vireos; assessed habitat characteristics of Black-capped Vireo nesting areas; collected GPS data on territory size and managed point count and nest searching data

Piping Plover Research for Sleeping Bear Dunes National Lakeshore, National Park Service*, Michigan, USA (2006) (Research Intern)
Surveyed shoreline for nesting pairs and established nest locations; built enclosures around nests; monitored adults and chicks daily; assisted with banding of chicks and adults; collected GPS data and produced maps of nesting areas; researched effects of increasing nest density and presented findings at a multi-agency end-of-season meeting; co-authored an article published in the National Park Service

Site Surveys and Environmental Assessments for Ontario Heritage Trust*, Various Sites, Ontario (2003) (Natural Heritage Assistant)
Conducted site visits and environmental assessments of ecologically significant natural areas in southern Ontario; monitored and documented invasive and endangered plant species; maintained database on protected areas and researched ecological information on properties using the MNRs NHIC database

Research / Laboratories

Wildlife Research for Sierra Club of Canada*, Ottawa, Ontario (2006) (Research Intern)
Researched wildlife management policies and programs implemented by forestry companies certified under the Sustainable Forestry Initiative (SFI) to protect species at risk and critical habitat. Researched numerous species under consideration for addition to the list of species at risk under the Species at Risk Act. Helped plan and participated in public outreach campaigns to raise awareness of Canada's endangered species

Graduate Research*, Toronto, Ontario (2003-2005)
Researched the microbial ecology of Avian influenza A H5N1, E. coli 0157:H7, and antimicrobial resistance; conducted advanced analysis of the spread of West Nile virus throughout North America and the outbreak of E. coli 0157:H7 in Walkerton, Ontario using hierarchy theory and panarchy theory; researched and analyzed the effects of climate change on emerging waterborne diseases; performed policy research to assess the effects of relevant legislation on the emergence of new diseases

** denotes projects completed with other firms*

Name: Bob Stamp, B.Sc.
Company or organization: Stantec Consulting Ltd.
Address: 70 Southgate Dr. Suite 1, Guelph, ON N1G 4P5
Phone: (519) 836-6050 **Fax:** (519) 836-2493
Email: bob.stamp@stantec.com

Bob is an avid naturalist with more than 50 years of experience, primarily with birding. At Stantec, Bob is responsible for carrying out seasonal bird and wildlife field surveys throughout Ontario, including pre and post construction monitoring at wind farms across the province. Bob also has extensive experience conducting wildlife surveys for development and aggregate projects.

Bob carried out wildlife inventory work for this project.

Name: James (Jim) Heslop
Company or organization: Stantec Consulting Ltd.
Address: 70 Southgate Dr. Suite 1, Guelph, ON N1G 4P5
Phone: (519) 836-6050 **Fax:** (519) 836-2493
Email: james.heslop@stantec.com

James is an avid naturalist with more than 30 years of experience, primarily with birding. He has volunteered with the Audubon Christmas Bird Censuses in Pickering, Hamilton, Fisherville, St. Catherine's, and 25 years at Long Point. James was a volunteer for the Ontario Breeding Bird Atlas from 1981 to 1985, and from 2001 to 2005 (including point counts). He has also been involved with Ontario Forest Bird Monitoring of the Dundas Valley, was past recording secretary of the Norfolk Field Naturalists (NFN), past president of the Pickering Field Naturalists (PFN), was a Founding Member and is a Life Member of the Ontario Field Ornithologists (OFO), was the past lead editor of OFO News, past publicity director of the Hamilton Naturalists' Club (HNC), is the current treasurer of the HNC, is the leader of field outings for the NFN, PFN, HNC and OFO, and is a current member of Hamilton Waterfront Trust Eastport Drive Trail Project Advisory Group.

James carried out wildlife inventory work for this project.

Appendix D

Amherst Island Project Area: Vegetation List

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		**FERNS & ALLIES**							
Dryopteridaceae		**Wood Fern Family**							
Athyrium	*filix-femina* var. *angustum*	Northern Lady Fern	4	0		S5			G5T5
Dryopteris	*carthusiana*	Spinulose Wood Fern	5	-2		S5			G5
Onoclea	*sensibilis*	Sensitive Fern	4	-3		S5			G5
Equisetaceae		**Horsetail Family**							
Equisetum	*arvense*	Field Horsetail	0	0		S5			G5
Ophioglossaceae		**Adder's Tongue Family**							
Botrychium	*virginianum*	Rattlesnake Fern	5	3		S5			G5
Thelypteridaceae		**Marsh Fern Family**							
Thelypteris	*palustris* var. *pubescens*	Marsh Fern	5	-4		S5			G5T?
GYMNOSPERMS		**CONIFERS**							
Cupressaceae		**Cedar Family**							
Juniperus	*virginiana*	Eastern Red Cedar				S5			G5
Pinaceae		**Pine Family**							
Picea	*glauca*	White Spruce	6	3		S5			G5
Pinus	*banksiana*	Jack Pine	9	3		S5			G5
Pinus	*nigra*	Austrian Pine		-5	-1	SE2			G?
Pinus	*strobus*	Eastern White Pine	4	3		S5			G5
Pinus	*sylvestris*	Scotch Pine		5	-3	SE5			G?
DICOTYLEDONS		**DICOTS**							
Aceraceae		**Maple Family**							
Acer	*saccharum* ssp. *saccharum*	Sugar Maple	4	3		S5			G5T?
Acer X	*freemanii*	Freeman's Maple							
Anacardiaceae		**Sumac or Cashew Family**							
Rhus	*aromatica*	Fragrant Sumac	8	5		S5			G5
Rhus	*radicans* ssp. *negundo*	Poison-ivy	5	-1		S5			G5T
Rhus	*typhina*	Staghorn Sumac	1	5		S5			G5
Apiaceae		**Carrot or Parsley Family**							
Cicuta	*bulbifera*	Bulb-bearing Water-hemlock	5	-5		S5			G5
Cicuta	*maculata*	Spotted Water-hemlock	6	-5		S5			G5
Daucus	*carota*	Wild Carrot		5	-2	SE5			G?
Osmorhiza	*claytonii*	Woolly Sweet-cicely	5	4		S5			G5
Pastinaca	*sativa*	Wild Parsnip		5	-3	SE5			G?
Sanicula	*marilandica*	Black Snakeroot	5	3		S5			G5
Sium	*suave*	Hemlock Water-parsnip	4	-5		S5			G5
Apocynaceae		**Dogbane Family**							
Apocynum	*androsaemifolium* ssp. *androsaemifolium*	Spreading Dogbane	3	5		S5			G5T?
Apocynum	*cannabinum* var. *cannabinum*	Indian Hemp		1		S5			G5T
Aquifoliaceae		**Holly Family**							
Ilex	*verticillata*	Winterberry	5	-4		S5			G5
Asclepiadaceae		**Milkweed Family**							
Asclepias	*incarnata* ssp. *incarnata*	Swamp Milkweed	6	-5		S5			G5T5
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5
Cynanchum	*rossicum*	Swallow-wort				SE5			G?
Asteraceae		**Composite or Aster Family**							
Achillea	*millefolium* ssp. *millefolium*	Common Yarrow		3	-1	SE?			G5T?
Ambrosia	*artemisiifolia*	Common Ragweed	0	3		S5			G5
Arctium	*minus*	Common Burdock		5	-2	SE5			G?T?
Bidens	*frondosa*	Devil's Beggar-ticks	3	-3		S5			G5
Carduus	*nutans* ssp. *nutans*	Musk Thistle		5	-1	SE?			G?T?
Centaurea	*jacea*	Brown Knapweed		5	-1	SE5			G?
Cichorium	*intybus*	Chicory		5	-1	SE5			G?
Cirsium	*arvense*	Canada Thistle		3	-1	SE5			G?
Cirsium	*vulgare*	Bull Thistle		4	-1	SE5			G5
Erigeron	*philadelphicus var . philadelphicus*	Philadelphia Fleabane	1	-3		S5			G5T?
Erigeron	*strigosus*	Daisy Fleabane	0	1		S5			G5
Eupatorium	*perfoliatum*	Perfoliate Thoroughwort	2	-4		S5			G5
Eurybia	*macrophylla*	Large-leaved Aster	5	5		S5			G5
Euthamia	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5
Helianthus	*divaricatus*	Rough Woodland Sunflower	7	5		S5			G5
Inula	*helenium*	Elecampane		5	-2	SE5			G?
Lactuca	*biennis*	Biennial Lettuce	6	0		S5			G5

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		**FERNS & ALLIES**							
Leucanthemum	*vulgare*	Ox-eye Daisy		5	-1	SE5			G?
Solidago	*altissima ssp. altissima*	Tall Goldenrod	1	3		S5			
Solidago	*canadensis var. canadensis*	Canada Goldenrod	1	3		S5			G5
Solidago	*flexicaulis*	Zig-zag Goldenrod	6	3		S5			G5
Solidago	*gigantea*	Giant Goldenrod	4	-3		S5			G5
Solidago	*juncea*	Early Goldenrod	3	5		S5			G5
Solidago	*nemoralis var. nemoralis*	Gray Goldenrod	2	5		S5			G5T?
Solidago	*patula ssp. patula*	Rough-leaved Goldenrod	8	-5		S5			G5
Sonchus	*arvensis* ssp. *arvensis*	Field Sow-thistle				SE5			G?T?
Symphyotrichum	*cordifolium*	Heart-leaved Aster	5	5		S5			G5
Symphyotrichum	*ericoides var. ericoides*	White Heath Aster				S5			G5T5
Symphyotrichum	*lanceolatum ssp. lanceolatum*	White Panicled Aster	3	-3		S5			G5T5
Symphyotrichum	*lateriflorum var. lateriflorum*	Calico Aster	3	-2		S5			G5T5
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5			G5
Symphyotrichum	*puniceum* var. *puniceum*	Purple-stemmed Aster	6	-5		S5			G5
Taraxacum	*officinale*	Common Dandelion		3	-2	SE5			G5
Tragopogon	*dubius*	Doubtful Goat's-beard		5	-1	SE5			G?
Xanthium	*strumarium*	Tumor-curing Cocklebur	2	0		S5			G?
Balsaminaceae		**Touch-me-not Family**							
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5
Impatiens	*glandulifera*	Glandular Touch-me-not		-3	-2	SE4			G?
Berberidaceae		**Barberry Family**							
Caulophyllum	*giganteum*	Blue Cohosh				S5			G
Podophyllum	*peltatum*	May-apple	5	3		S5			G5
Betulaceae		**Birch Family**							
Betula	*alleghaniensis*	Yellow Birch	6	0		S5			G5
Betula	*papyrifera*	White Birch		2		S5			G5
Carpinus	*caroliniana* ssp. *virginiana*	Blue Beech	6	0		S5			G5T
Ostrya	*virginiana*	Hop Hornbeam	4	4		S5			G5
Boraginaceae		**Borage Family**							
Cynoglossum	*officinale*	Hound's-tongue		5	-1	SE5			G?
Echium	*vulgare*	Blueweed		5	-2	SE5			G?
Brassicaceae		**Mustard Family**							
Alliaria	*petiolata*	Garlic Mustard		0	-3	SE5			G5
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5
Callitrichaceae		**Water-starwort Family**							
Callitriche	*palustris*	Marsh Water-starwort		-5		S5			G5
Campanulaceae		**Bellflower Family**							
Lobelia	*inflata*	Indian Tobacco	3	4		S5			G5
Caprifoliaceae		**Honeysuckle Family**							
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?
Sambucus	*canadensis*	Common Elderberry	5	-2		S5			G5
Triosteum	*aurantiacum*	Wild Coffee	7	5		S5			G5
Viburnum	*lentago*	Nannyberry	4	-1		S5			G5
Viburnum	*rafinesquianum*	Downy Arrow-wood	7	5		S5			G5
Caryophyllaceae		**Pink Family**							
Dianthus	*armeria*	Deptford Pink		5	-1	SE5			G?
Cerastium	*species*	Chickweed species							
Celastraceae		**Staff-tree Family**							
Celastrus	*scandens*	Climbing Bittersweet	3	3		S5			G5
Euonymus	*obovata*	Running Strawberry-bush	6	5		S5			G5
Chenopodiaceae		**Goosefoot Family**							
Chenopodium	*album* var. *album*	Lamb's Quarters		1	-1	SE5			G5T5
Convolvulaceae		**Morning-glory Family**							
Calystegia	*sepium* ssp. *angulatum*	Hedge Bindweed				SU			G4G5T?
Convolvulus	*arvensis*	Field Bindweed		5	-1	SE5			G?
Cuscuta	*gronovii*	Gronovius' Dodder	4	-3		S5			G5
Cornaceae		**Dogwood Family**							
Cornus	*amomum* ssp. *obliqua*	Silky Dogwood	5	-4		S5			G5T?
Cornus	*foemina* ssp. *racemosa*	Red Panicled Dogwood	2	-2		S5			G5?

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		**FERNS & ALLIES**							
Elaeagnaceae		**Oleaster Family**							
Shepherdia	*canadensis*	Canada Soapberry	7	5		S5			G5
Fabaceae		**Pea Family**							
Amphicarpaea	*bracteata*	Hog Peanut	4	0		S5			G5
Lathyrus	*species*	Pea species							
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5			G?
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?
Medicago	*sativa* ssp. *sativa*	Alfalfa		5	-1	SE5			G?T?
Melilotus	*alba*	White Sweet-clover		3	-3	SE5			G?
Melilotus	*officinalis*	Yellow Sweet-clover		3	-1	SE5			G?
Robinia	*pseudo-acacia*	Black Locust		4	-3	SE5			G5
Trifolium	*aureum*	Yellow Clover		5	-1	SE5			G?
Trifolium	*pratense*	Red Clover		2	-2	SE5			G?
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?
Fagaceae		**Beech Family**							
Fagus	*grandifolia*	American Beech	6	3		S5			G5
Quercus	*alba*	White Oak	6	3		S5			G5
Quercus	*macrocarpa*	Bur Oak	5	1		S5			G5
Quercus	*rubra*	Red Oak	6	3		S5			G5
Geraniaceae		**Geranium Family**							
Geranium	*robertianum*	Herb-robert		5	-2	SE5			G5
Grossulariaceae		**Currant Family**							
Ribes	*species*								
Ribes	*americanum*	Wild Black Currant	4	-3		S5			G5
Ribes	*cynosbati*	Prickly Gooseberry	4	5		S5			G5
Guttiferae		**St. John's-wort Family**							
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SE5			G?
Juglandaceae		**Walnut Family**							
Carya	*cordiformis*	Bitternut hickory	6	0		S5			G5
Carya	*ovata* var. *ovata*	Shagbark Hickory	6	3		S5			G5
Juglans	*cinerea*	Butternut	6	2		S3?	END	END	G4
Juglans	*nigra*	Black Walnut	5	3		S4			G5
Lamiaceae		**Mint Family**							
Clinopodium	*vulgare*	Wild Basil	4	5		S5			G?
Glechoma	*tetrahit*	Common Hemp-nettle		5	-1	SE5			G?
Leonurus	*cardiaca* ssp. *cardiaca*	Common Motherwort		5	-2	SE5			G?T?
Lycopus	*americanus*	Cut-leaved Water-horehound	4	-5		S5			G5
Lycopus	*europaeus*	European Water-horehound		-5	-2	SE5			G?
Lycopus	*uniflorus*	Northern Water-horehound	5	-5		S5			G5
Mentha	*arvensis* ssp. *borealis*	American Wild Mint	3	-3		S5			
Nepeta	*cataria*	Catnip		1	-2	SE5			G?
Prunella	*vulgaris* ssp. *lanceolata*	Heal-all	5	5		S5			G5T?
Scutellaria	*galericulata*	Hooded Skullcap	6	-5		S5			G5
Scutellaria	*lateriflora*	Mad-dog Skullcap	5	-5		S5			G5
Teucrium	*canadense* ssp. *canadense*	Wood Germander	6	-2		S5?			G5T?
Lythraceae		**Loosestrife Family**							
Decodon	*verticillatus*	Swamp Loosestrife	7	-5		S5			G5
Lythrum	*salicaria*	Purple Loosestrife		-5	-3	SE5			G5
Oleaceae		**Olive Family**							
Fraxinus	*americana*	White Ash	4	3		S5			G5
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5
Fraxinus	*pennsylvanica*	Red Ash	3	-3		S5			G5
Syringa	*vulgaris*	Common Lilac		5	-2	SE5			G?
Onagraceae		**Evening-primrose Family**							
Circaea	*lutetiana* ssp. *canadensis*	Yellowish Enchanter's Nightshade	3	3		S5			G5T5
Epilobium	*ciliatum* ssp. *glandulosum*	Northern Willow-herb	6	3		SU			G5T?
Oenothera	*biennis*	Common Evening-primrose	0	3		S5			G5
Oxalidaceae		**Wood Sorrel Family**							
Oxalis	*species*								
Oxalis	*stricta*	Upright Yellow Wood-sorrel	0	3		S5			G5
Papaveraceae		**Poppy Family**							
Sanguinaria	*canadensis*	Bloodroot	5	4		S5			G5

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		**FERNS & ALLIES**							
Phrymaceae		**Lopseed Family**							
Phryma	*leptostachya*	Lopseed	6	5		S4S5			G5
Plantaginaceae		**Plantain Family**							
Plantago	*rugelii*	Rugel's Plantain	1	0		S5			G5
Polygonaceae		**Smartweed Family**							
Polygonum	*species*								
Polygonum	*persicaria*	Lady's-thumb		-3	-1	SE5			G?
Polygonum	*sagittatum*	Arrow-leaved Tearthumb	5	-5		S4			G5
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SE5			G?
Primulaceae		**Primrose Family**							
Lysimachia	*ciliata*	Fringed Loosestrife	4	-3		S5			G5
Ranunculaceae		**Buttercup Family**							
Actaea	*pachypoda*	White Baneberry	6	5		S5			G5
Actaea	*rubra*	Red Baneberry	5	5		S5			G5
Anemone	*canadensis*	Canada Anemone	3	-3		S5			G5
Anemone	*cylindrica*	Thimbleweed	7	5		S4			G5
Ranunculus	*acris*	Tall Buttercup			-2	SE5			G5
Thalictrum	*dioicum*	Early Meadow-rue	5	2		S5			G5
Rhamnaceae		**Buckthorn Family**							
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SE5			G?
Rosaceae		**Rose Family**							
Agrimonia	*gryposepala*	Tall Hairy Agrimony	2	2		S5			G5
Amelanchier	*species*								
Crataegus	*species*	Hawthorn species							
Fragaria	*vesca* ssp. *americana*	Woodland Strawberry	4	4		S5			G5T?
Fragaria	*virginiana* ssp. *virginiana*	Scarlet Strawberry	2	1		SU			G5T?
Geum	*aleppicum*	Yellow Avens	2	-1		S5			G5
Geum	*canadense*	White Avens	3	0		S5			G5
Geum	*rivale*	Purple Avens	7	-5		S5			G5
Malus	*species*								
Potentilla	*recta*	Rough-fruited Cinquefoil		5	-2	SE5			G?
Potentilla	*simplex*	Old-field Cinquefoil	3	4		S5			G5
Prunus	*serotina*	Black Cherry	3	3		S5			G5
Prunus	*virginiana* ssp. *virginiana*	Choke Cherry	2	1		S5			G5T?
Rosa	*species*								
Rosa	*palustris*	Marsh Rose	7	-5		S5			G5
Rubus	*allegheniensis*	Alleghany Blackberry	2	2		S5			G5
Rubus	*idaeus* ssp. *strigosus*	Wild Red Raspberry	0	-2		S5			G5T5
Rubus	*occidentalis*	Thimble-berry	2	5		S5			G5
Rubus	*odoratus*	Purple Flowering Raspberry	3	5		S5			G5
Rubus	*pubescens*	Dwarf Raspberry	4	-4		S5			G5
Spiraea	*alba*	Narrow-leaved Meadow-sweet	3	-4		S5			G5
Waldsteinia	*fragarioides*	Barren Strawberry	5	5		S5			G5
Rubiaceae		**Madder Family**							
Cephalanthus	*occidentalis*	Eastern Buttonbush	7	-5		S5			G5
Galium	*aparine*	Cleavers	4	3		S5			G5
Galium	*mollugo*	White Bedstraw		5	-2	SE5			G?
Galium	*palustre*	Marsh Bedstraw	5	-5		S5			G5
Galium	*triflorum*	Sweet-scented Bedstraw	4	2		S5			G5
Rutaceae		**Rue Family**							
Zanthoxylum	*americanum*	American Prickly-ash	3	5		S5			G5
Salicaceae		**Willow Family**							
Populus	*tremuloides*	Trembling Aspen		0		S5			G5
Salix	*bebbiana*	Long-beaked Willow	4	-4		S5			G5
Salix	*discolor*	Pussy Willow	3	-3		S5			G5
Salix	*nigra*	Black Willow	6	-5		S4?			G5
Salix	*petiolaris*	Slender Willow	3	-4		S5			G4
Scrophulariaceae		**Figwort Family**							
Chelone	*glabra*	Turtlehead	7	-5		S5			G5
Linaria	*vulgaris*	Butter-and-eggs		5	-1	SE5			G?
Mimulus	*ringens*	Square-stemmed Monkey-flower	6	-5		S5			G5
Verbascum	*thapsus*	Common Mullein		5	-2	SE5			G?
Veronica	*anagallis-aquatica*	Water Speedwell		-5	-1	SE5			G5

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		**FERNS & ALLIES**							
Solanaceae		**Nightshade Family**							
Solanum	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?
Tiliaceae		**Linden Family**							
Tilia	*americana*	American Basswood	4	3		S5			G5
Ulmaceae		**Elm Family**							
Ulmus	*americana*	White Elm	3	-2		S5			G5?
Ulmus	*rubra*	Slippery Elm	6	0		S5			G5
Urticaceae		**Nettle Family**							
Boehmeria	*cylindrica*	False Nettle	4	-5		S5			G5
Laportea	*canadensis*	Wood Nettle	6	-3		S5			G5
Pilea	*pumila*	Dwarf Clearweed	5	-3		S5			G5
Urtica	*dioica* ssp. *gracilis*	American Stinging Nettle	2	-1		S5			G5T?
Verbenaceae		**Vervain Family**							
Verbena	*hastata*	Blue Vervain	4	-4		S5			G5
Violaceae		**Violet Family**							
Viola	*species*								
Viola	*pubescens*	Downy Yellow Violet				S5			G5
Vitaceae		**Grape Family**							
Parthenocissus	*inserta*	Inserted Virginia-creeper	3	3		S5			G5
Vitis	*riparia*	Riverbank Grape	0	-2		S5			G5
MONOCOTYLEDONS		**MONOCOTS**							
Alismataceae		**Water-plantain Family**							
Alisma	*plantago-aquatica*	Common Water-plantain	3	-5		S5			G5
Sagittaria	*latifolia*	Broad-leaved Arrowhead	4	-5		S5			G5
Araceae		**Arum Family**							
Arisaema	*triphyllum* ssp. *triphyllum*	Small Jack-in-the-pulpit	5	-2		S5			G5T5
Butomaceae		**Flowering Rush Family**							
Butomus	*umbellatus*	Flowering-rush		-5	-2	SE5			G5
Cyperaceae		**Sedge Family**							
Carex	*species*	Sedge species							
Carex	*bebbii*	Bebb's Sedge	3	-5		S5			G5
Carex	*crinita var. crinita*	Fringed Sedge	6	-4		S5			G5
Carex	*gracillima*	Graceful Sedge	4	3		S5			G5
Carex	*granularis*	Meadow Sedge	3	-4		S5			G5
Carex	*interior*	Inland Sedge	6	-5		S5			G5
Carex	*intumescens*	Bladder Sedge	6	-4		S5			G5
Carex	*lacustris*	Lake-bank Sedge	5	-5		S5			G5
Carex	*lupulina*	Hop Sedge	6	-5		S5			G5
Carex	*pellita*	Woolly Sedge	4	-5		S5			G5
Carex	*pensylvanica*	Pennsylvania Sedge	5	5		S5			G5
Carex	*retrorsa*	Retrorse Sedge	5	-5		S5			G5
Carex	*rosea*	Stellate Sedge	5	5		S5			G5
Carex	*spicata*	Spiked Sedge		5	-1	SE5			GNR
Carex	*stipata var. stipata*	Awl-fruited Sedge	3	-5		S5			G5
Carex	*tenera var. tenera*	Straw Sedge	4	-1		S5			G5
Carex	*vulpinoidea*	Fox Sedge	3	-5		S5			G5
Eleocharis	*ovata*	Ovoid Spike-rush	8	-5		S5			G5
Schoenoplectus	*pungens var. pungens*	Common Three-square	6	-5		S5			G5
Schoenoplectus	*tabernaemontani*	Soft-stemmed Bulrush	5	-5		S5			G5
Schoenoplectus	*torreyi*	Torrey's Bulrush	10	-5		S4			G5?
Scirpus	*atrovirens*	Dark-green Bulrush	3	-5		S5			G5?
Scirpus	*cyperinus*	Wool-grass	4	-5		S5			G5
Hydrocharitaceae		**Frog's-bit Family**							
Hydrocharis	*morsus-ranae*	Frog's-bit		-5	-3	SE5			G?
Iridaceae		**Iris Family**							
Iris	*versicolor*	Multi-coloured Blue-flag	5	-5		S5			G5
Juncaceae		**Rush Family**							
Juncus	*species*								
Juncus	*effusus* ssp. *solutus*	Soft Rush	4	-5		S5			G5T?
Juncus	*tenuis*	Path Rush	0	0		S5			G5

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		**FERNS & ALLIES**							
Juncus	*torreyi*	Torrey's Rush	3	-3		S5			G5
Lemnaceae		**Duckweed Family**							
Lemna	*minor*	Lesser Duckweed	2	-5		S5			G5
Liliaceae		**Lily Family**							
Allium	*tricoccum*	Wild Leek	7	2		S5			G5
Asparagus	*officinalis*	Garden Asparagus		3	-1	SE5			G5?
Maianthemum	*canadense*	Wild Lily-of-the-valley	5	0		S5			G5
Maianthemum	*racemosum* ssp. *racemosum*	False Solomon's Seal	4	3		S5			G5T
Polygonatum	*pubescens*	Hairy Solomon's Seal	5	5		S5			G5
Trillium	*grandiflorum*	White Trillium	5	5		S5			G5
Orchidaceae		**Orchid Family**							
Epipactis	*helleborine*	Common Helleborine		5	-2	SE5			G?
Platanthera	*psycodes*	Smaller Purple-fringed Orchis	8	-3		S5			G5
Poaceae		**Grass Family**							
Grass	*species*								
Agrostis	*gigantea*	Red-top		0	-2	SE5			G4G5
Agrostis	*stolonifera*	Redtop		-3		S5			G5
Bromus	*inermis* ssp. *inermis*	Awnless Brome		5	-3	SE5			G4G5T?
Calamagrostis	*canadensis var. canadensis*	Blue-joint Grass	4	-5					
Cinna	*arundinacea*	Wood Reed Grass	7	-3		S4			G5
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5			G?
Echinochloa	*crus-galli*	Common Barnyard Grass		-3	-1	SE5			G?
Elymus	*hystrix*	Bottle-brush Grass	5	5		S5			G5
Elymus	*repens*	Quack Grass		3	-3	SE5			GNR
Elymus	*virginicus* var. *virginicus*	Virginia Wild Rye	5	-2		S5			G5T5
Glyceria	*maxima*	Rough Manna Grass		-5	-1	SE5			GNR
Glyceria	*striata*	Fowl Meadow Grass	3	-5		S4S5			G5T5
Leersia	*oryzoides*	Rice Cut Grass	3	-5		S5			G5
Panicum	*species*								
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5			G5
Phleum	*pratense ssp. pratense*	Timothy		3	-1	SE5			G?
Phragmites	*australis ssp. australis*	European Reed				SNR			GNR
Poa	*compressa*	Canada Blue Grass		2		SE			GNR
Poa	*palustris*	Fowl Meadow Grass	5	-4		S5			G5
Poa	*pratensis* ssp. *pratensis*	Kentucky Bluegrass	0	1		S5			G5T5
Sporobolus	*species*	Dropseed species							
Sparganiaceae		**Bur-reed Family**							
Sparganium	*eurycarpum*	Broad-fruited Bur-reed	3	-5		S5			G5
Typhaceae		**Cattail Family**							
Typha	*angustifolia*	Narrow-leaved Cattail	3	-5		S5			G5
Typha	*latifolia*	Broad-leaved Cattail	3	-5		S5			G5
FLORISTIC SUMMARY & ASSESSMENT									
Species Diversity									
Total Species:		**258**							
Native Species:		**191**	74%						
Exotic Species		**67**	26%						
Regionally Significant Species		enter manually							
Locally Significant Species		enter manually							
S1-S3 Species		1	1%						
S4 Species		8	4%						
S5 Species		179	95%						
Co-efficient of Conservatism and Floristic Quality Index									
Co-efficient of Conservatism (CC) (average)		**4.2**							
CC 0 to 3	*lowest sensitivity*	63	35%						
CC 4 to 6	*moderate sensitivity*	100	55%						
CC 7 to 8	*high sensitivity*	17	9%						
CC 9 to 10	*highest sensitivity*	2	1%						
Floristic Quality Index (FQI)		**57**							
Presence of Weedy & Invasive Species									
mean weediness		**-1.8**							
weediness = -1	*low potential invasiveness*	28	44%						
weediness = -2	*moderate potential invasiveness*	22	35%						
weediness = -3	*high potential invasiveness*	13	21%						
Presence of Wetland Species									
average wetness value		**0.2**							
upland		59	24%						
facultative upland		56	22%						
facultative		33	13%						
facultative wetland		49	20%						
obligate wetland		53	21%						

Appendix E

Amherst Island Project Area: Wildlife List

Overall Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	COSSARO	COSEWIC	Observed Breeding	Observed During Migration	Observed Winter	Observed Incidentally
ODONATA								
Lance-Tipped Darner	*Aeshna constricta*	S5						x
BUTTERFLIES								
Tawny-edged Skipper	*Polites themistocles*	S5						x
Giant Swallowtail	*Papilio cresphontes*	S3				x		x
Eastern Tailed Blue	*Everes comyntas*	S5						x
Common Buckeye	*Junonia coenia*	SNA						x
Monarch	*Danaus plexippus*	S4B, S2N	SC	SC		x		x
AMPHIBIANS								
American Toad	*Anaxyrus americanus*	S5			x			
Western Chorus Frog (carolinian)	*Pseudacris triseriata*	S4	NAR	NAR	x			
Spring Peeper	*Pseudacris crucifer*	S5			x			
Bullfrog	*Lithobates catesbeiana*	S4			x			
Northern Green Frog	*Lithobates clamitans*	S5			x			
Wood Frog	*Lithobates sylvatica*	S5			x			
Northern Leopard Frog	*Lithobates pipiens*	S5	NAR	NAR	x			
REPTILES								
Eastern Gartersnake	*Thamnophis sirtalis*	S5						x
Brown Snake	*Storeria dekayi*	S5		NAR				x
BIRDS								
Snow Goose	*Chen caerulescens*	S5B				x		
Canada Goose	*Branta canadensis*	S5			x	x		
Brant Goose	*Branta bernicla*	S4N				x		
Mute Swan	*Cygnus olor*	SNA				x		
Tundra Swan	*Cygnus colombianus*	S4				x		
Wood Duck	*Aix sponsa*	S5			x	x		
Gadwall	*Anas strepera*	S4			x	x		
American Wigeon	*Anas americana*	S4			x			
Eurasian wigeon	*Anas penelope*	SNA				x		
American Black Duck	*Anas rubripes*	S4				x		
Mallard	*Anas platyrhynchos*	S5			x	x		
Blue-winged Teal	*Anas discors*	S4				x		
Northern Shoveler	*Anas clypeata*	S4				x		
Northern Pintail	*Anas acuta*	S5			x	x		
Green-winged Teal	*Anas crecca*	S4			x	x		
Ring-necked Duck	*Aythya collaris*	S5				x		
Greater Scaup	*Aythya marila*	S4				x		
Lesser Scaup	*Aythya affinis*	S4				x		
Bufflehead	*Bucephala albeola*	S4				x		
Common Goldeneye	*Bucephala clangula*	S5				x		

Overall Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	COSSARO	COSEWIC	Observed Breeding	Observed During Migration	Observed Winter	Observed Incidentally
Harlequin duck	*Histrionicus histrionicus*					x		
Long-tailed duck	*Clangula hyemalis*	S3B				x		
White-winged Scoter	*Melanitta deglandi*					x		
Hooded Merganser	*Lophodytes cucullatus*	S5B,S5N				x		
Common Merganser	*Mergus merganser*	S5B,S5N				x		
Red-breasted Merganser	*Mergus serrator*	S4B,S5N				x		
Ring-necked Pheasant	*Phasianus colchicus*	SNA			x	x		
Wild Turkey	*Meleagris gallopava*	S5				x		
Common Loon	*Gavia immer*	S5B,S5N	NAR	NAR	x	x		
Horned grebe	*Podiceps auritus*					x		
Double-crested Cormorant	*Phalacrocorax auritus*	S5B	NAR	NAR	x	x		
American Bittern	*Botaurus lentiginosus*	S4B			x			
Least Bittern	*Ixobrychus exilis*	S4B	THR	THR		x		
Great Blue Heron	*Ardea herodias*	S5			x	x		
Green Heron	*Butorides virescens*	S4B			x	x		
Black-crowned Night-Heron	*Nycticorax nycticorax*	S3B,S3N				x		
Turkey Vulture	*Cathartes aura*	S5B			x	x		
Osprey	*Pandion haliaetus*	S5B			x	x		
Bald Eagle	*Haliaeetus leucocephalus*	S2N,S4B	SC	NAR		x		
Northern Harrier	*Circus cyaneus*	S4B	NAR	NAR	x	x	x	
Sharp-shinned Hawk	*Accipiter striatus*	S5	NAR	NAR	x	x		
Cooper's Hawk	*Accipiter cooperii*	S4	NAR	NAR		x		
Red-tailed Hawk	*Buteo jamaicensis*	S5	NAR	NAR	x	x	x	
Rough-legged Hawk	*Buteo lagopus*	S1B, S4N	NAR	NAR		x	x	
American Kestrel	*Falco sparverius*	S5B			x	x		
Merlin	*Falco columbarius*	S5B	NAR	NAR	x	x		
Peregrine Falcon	*Falco peregrinus*	S3B	THR	THR		x		
Virginia Rail	*Rallus limicola*	S5B			x	x		
Ruddy Turnstone	*Arenaria interpres*	SNA				x		
Short-billed Dowitcher	*Limnodromus griseus*	S3B,S4n				x		
Black-bellied Plover	*Pluvialis squatarola*	S4N			x	x		
Semipalmated Plover	*Charadrius semipalmatus*	S4B,S4N				x		
Killdeer	*Charadrius vociferus*	S5B, S5N			x	x		
Spotted Sandpiper	*Actitis macularia*	S5			x	x		
Solitary Sandpiper	*Tringa solitaria*	S4B				x		
Lesser Yellowlegs	*Tringa flavipes*	S4B,S4N			x			
Upland Sandpiper	*Bartramia longicauda*	S4B			x	x		
Dunlin	*Calidris alpina*	S4B, S5N				x		
White-rumped Sandpiper	*Calidris fuscicollis*	S5N			x			
Least Sandpiper	*Calidris minutilla*	S4B,S5N				x		
Semipalmated Sandpiper	*Calidris pusilla*	S3B,S4N			x	x		
Wilson's Snipe	*Gallinago delicata*	S5B			x	x		
American Woodcock	*Scolopax minor*	S4B			x	x		
Wilson's Phalarope	*Phalaropus tricolor*	S3B			x	x		
Bonaparte's Gull	*Larus philadelphia*	S4B,S4N				x		

Overall Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	COSSARO	COSEWIC	Observed Breeding	Observed During Migration	Observed Winter	Observed Incidentally
Ring-billed Gull	*Larus delawarensis*	S5B,S4N			x	x		
Herring Gull	*Larus argentatus*	S5B,S5N			x	x		
Caspian Tern	*Hydroprogne caspia*	S3B	NAR	NAR	x			
Rock Pigeon	*Columba livia*	SNA			x	x		
Mourning Dove	*Zenaida macroura*	S5			x	x		
Yellow-billed Cuckoo	*Coccyzus americanus*	S4B			x			
Black-billed Cuckoo	*Coccyzus erythropthalmus*	S5B			x			
Great Horned Owl	*Bubo virginianus*	S5			x	x		
Snowy Owl	*Bubo scandiaca*	SNA	NAR	NAR			x	
Short-eared Owl	*Asio flammeus*	S2N, S4B	SC	SC-3			x	
Northern Saw-whet Owl	*Aegolius acadicus*	S4				x		
Ruby-throated Hummingbird	*Archilochus colubris*	S5B			x	x		
Belted Kingfisher	*Ceryle alcyon*	S4B			x	x		
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S4B	SC	THR		x		
Red-bellied Woodpecker	*Melanerpes carolinus*	S4			x	x		
Yellow-bellied Sapsucker	*Sphyrapicus varius*	S5B			x	x		
Downy Woodpecker	*Picoides pubescens*	S5			x	x		
Hairy Woodpecker	*Picoides villosus*	S5			x	x		
Black-backed Woodpecker	*Picoides arcticus*	S4				x		
Northern Flicker	*Colaptes auratus*	S4B			x	x		
Pileated Woodpecker	*Dryocopus pileatus*	S5				x		
Olive-sided Flycatcher	*Contopus borealis*	S4B	SC	THR		x		
Eastern Wood-Pewee	*Contopus virens*	S4B			x	x		
Yellow-bellied Flycatcher	*Empidonax flaviventris*	S5B				x		
Alder Flycatcher	*Empidonax alnorum*	S5B			x	x		
Willow Flycatcher	*Empidonax traillii*	S5B			x	x		
Least Flycatcher	*Empidonax minimus*	S4B			x	x		
Eastern Phoebe	*Sayornis phoebe*	S5B			x	x		
Great Crested Flycatcher	*Myiarchus crinitus*	S4B			x	x		
Eastern Kingbird	*Tyrannus tyrannus*	S4B			x	x		
Northern Shrike	*Lanius excubitor*	SNA				x		
Blue-headed Vireo	*Vireo solitarius*	S5B				x		
Warbling Vireo	*Vireo gilvus*	S5B			x	x		
Philadelphia Vireo	*Vireo philadelphicus*	S5B				x		
Red-eyed Vireo	*Vireo olivaceus*	S5B			x	x		
Gray Jay	*Perisoreus canadensis*	S5				x		
Blue Jay	*Cyanocitta cristata*	S5			x	x		
American Crow	*Corvus brachyrhynchos*	S5B			x	x		
Common Raven	*Corvus corax*	S5			x	x		
Horned Lark	*Eremophila alpestris*	S5B			x			
Purple Martin	*Progne subis*	S4B			x	x		
Tree Swallow	*Tachycineta bicolor*	S4B			x	x		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S4B			x	x		
Bank Swallow	*Riparia riparia*	S4B			x	x		
Cliff Swallow	*Petrochelidon pyrrhonota*	S4B			x	x		

Overall Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	COSSARO	COSEWIC	Observed Breeding	Observed During Migration	Observed Winter	Observed Incidentally
Barn Swallow	*Hirundo rustica*	S4B	THR	THR-NS	x	x		
Black-capped Chickadee	*Poecile atricapillus*	S5			x	x		
Red-breasted Nuthatch	*Sitta canadensis*	S5				x		
White-breasted Nuthatch	*Sitta carolinensis*	S5			x	x		
Brown Creeper	*Certhia americana*	S5B			x	x		
Carolina Wren	*Thryothorus ludovicianus*	S4				x		
House Wren	*Troglodytes aedon*	S5B			x	x		
Winter Wren	*Troglodytes hiemalis*	S5B			x	x		
Sedge Wren	*Cistothorus platensis*	S4B	NAR	NAR	x			
Marsh Wren	*Cistothorus palustris*	S4B			x	x		
Golden-crowned Kinglet	*Regulus satrapa*	S5B				x		
Ruby-crowned Kinglet	*Regulus calendula*	S4B				x		
Eastern Bluebird	*Sialia sialis*	S5B	NAR	NAR		x		
Veery	*Catharus fuscescens*	S4B			x	x		
Swainson's Thrush	*Catharus ustulatus*	S4B				x		
Hermit Thrush	*Catharus guttatus*	S5B			x	x		
Wood Thrush	*Hylocichla mustelina*	S4B			x	x		
American Robin	*Turdus migratorius*	S5B			x	x		
Gray Catbird	*Dumetella carolinensis*	S4B			x	x		
Brown Thrasher	*Toxostoma rufum*	S4B			x	x		
European Starling	*Sturnus vulgaris*	SNA			x	x		
American Pipit	*Anthus rubescens*	S4				x		
Cedar Waxwing	*Bombycilla cedrorum*	S5B			x	x		
Ovenbird	*Seiurus aurocapilla*	S4B			x	x		
Northern Waterthrush	*Parkesia noveboracensis*	S5B			x	x		
Golden-winged Warbler	*Vermivora chrysoptera*	S4B	SC	THR		x		
Black-and-white Warbler	*Mniotilta varia*	S5B				x		
Tennessee Warbler	*Oreothlypis peregrina*	S5B				x		
Orange-crowned Warbler	*Oreothlypis celata*	S4B				x		
Nashville Warbler	*Oreothlypis ruficapilla*	S5B			x	x		
Mourning Warbler	*Geothlypis philadelphia*	S4B			x	x		
Common Yellowthroat	*Geothlypis trichas*	S5B			x	x		
Cerulean Warbler	*Dendroica cerulea*					x		
Hooded Warbler	*Setophaga citrina*	S3B	SC	THR		x		
American Redstart	*Setophaga ruticilla*	S5B			x	x		
Cape May Warbler	*Setophaga tigrina*	S5B				x		
Northern Parula	*Setophaga americana*	S4B				x		
Magnolia Warbler	*Setophaga magnolia*	S5B			x	x		
Bay-breasted Warbler	*Setophaga castanea*	S5B				x		
Blackburnian Warbler	*Setophaga fusca*	S5B				x		
Yellow Warbler	*Setophaga petechia*	S5B			x	x		
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B			x	x		
Blackpoll Warbler	*Setophaga striata*	S4B				x		
Black-throated Blue Warbler	*Setophaga caerulescens*	S5B				x		
Palm Warbler	*Setophaga palmarum*	S5B				x		

Overall Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	COSSARO	COSEWIC	Observed Breeding	Observed During Migration	Observed Winter	Observed Incidentally
Pine Warbler	*Setophaga pinus*	S5B			x			
Yellow-rumped Warbler	*Setophaga coronata*	S5B				x		
Prairie Warbler	*Setophaga discolor*	S3B	NAR	NAR		x		
Black-throated Green Warbler	*Setophaga virens*	S5B			x	x		
Canada Warbler	*Cardellina canadensis*	S4B	SC	THR		x		
Wilson's Warbler	*Cardellina pusilla*	S4B			x	x		
Eastern Towhee	*Pipilo erythrophthalmus*	S4B			x	x		
Chipping Sparrow	*Spizella passerina*	S5B			x	x		
Clay-colored Sparrow	*Spizella pallida*	S4B			x	x		
Field Sparrow	*Spizella pusilla*	S4B			x	x		
Savannah Sparrow	*Passerculus sandwichensis*	S4B			x	x		
Grasshopper Sparrow	*Ammodramus savannarum*	S4B			x	x		
Fox Sparrow	*Passerella iliaca*	S4B				x		
Song Sparrow	*Melospiza melodia*	S5B			x	x		
Lincoln's Sparrow	*Melospiza lincolnii*	S5B				x		
Swamp Sparrow	*Melospiza georgiana*	S5B			x	x		
White-throated Sparrow	*Zonotrichia albicollis*	S5B				x		
White-crowned Sparrow	*Zonotrichia leucophrys*	S4B				x		
Dark-eyed Junco	*Junco hyemalis*	S5B				x		
Scarlet Tanager	*Piranga olivacea*	S4B			x	x		
Northern Cardinal	*Cardinalis cardinalis*	S5			x	x		
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B			x	x		
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR-NS	x	x		
Red-winged Blackbird	*Agelaius phoeniceus*	S5			x	x		
Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR-NS	x	x		
Western Meadowlark	*Sturnella neglecta*	S3B				x		
Rusty Blackbird	*Euphagus carolinus*	S4B		SC		x		
Brewer's Blackbird	*Euphagus cyanocephalus*	S4B				x		
Common Grackle	*Quiscalus quiscula*	S5B			x	x		
Brown-headed Cowbird	*Molothrus ater*	S4B			x	x		
Orchard Oriole	*Icterus spurius*	S4B			x	x		
Baltimore Oriole	*Icterus galbula*	S4B			x	x		
Purple Finch	*Carpodacus purpureus*	S4B				x		
House Finch	*Carpodacus mexicanus*	SNA			x	x		
Pine Siskin	*Carduelis pinus*	S4B				x		
American Goldfinch	*Carduelis tristis*	S5B			x	x		
House Sparrow	*Passer domesticus*	SNA			x	x		