Ministry of Natural Resources

Confirmation Letter

December 14, 2012

Ministry of
Natural Resources

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Ontario

December 14, 2012

Windlectric Inc.
2845 Bristol Circle
Oakville Ontario
L6H 7H8

Attention: Mr. Sean Fairfield

Dear Mr. Fairfield,

In accordance with the Ministry of the Environment's (MOE's) Renewable Energy Approvals regulation (O.Reg.359/09), applicants are required to prepare a natural heritage assessment and environmental impact study using evaluation criteria or procedures established or accepted by the Ministry of Natural Resources (MNR). The regulation requires MNR to confirm that the natural heritage assessment and environmental impact study, including mitigation measures, were prepared using established procedures acceptable to MNR. The MNR's confirmation letter, along with other required project documentation, must be submitted to MOE as part of an application for a Renewable Energy Approval for consideration by MOE in making their Renewable Energy Approval decision.

The Ministry of Natural Resources (MNR) has reviewed the natural heritage assessment and environmental impact study for Windlectric Inc., Amherst Island Wind Energy Project, submitted December 3, 2012. Based on our review and understanding the aforementioned project is located at Amherst Island, Township of Loyalist.

In accordance with sections 28(2) and 38(2)(b) of the Renewable Energy Approvals regulation, MNR provides the following confirmations following review of the natural heritage assessment reports:

1. The MNR confirms that the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established or accepted by MNR.
2. The MNR confirms that the site investigation and records review were conducted using applicable evaluation criteria or procedures established or accepted by MNR.
3. The MNR confirms that the evaluation of the significance or provincial significance of the natural features was conducted using applicable evaluation criteria or procedures established or accepted by MNR.
4. The MNR confirms that the project location is not in a provincial park or conservation reserve.
5. The MNR confirms that the environmental impact study report has been prepared in accordance with procedures established by the MNR.

In accordance with Section 28(3)(c) and 38(2)(c) of the Renewable Energy Approvals regulation, MNR offers the following comments in respect of the project:

1) The potential for ongoing risk of negative environmental effects has been identified in the natural heritage assessment (NHA). The project and potential effects will be monitored as outlined with the Environmental Impact Study Report to ensure that proposed mitigation strategies are effective and contingency measures have been included for instances where performance objectives are not met.
2) As part of the Environmental Impact Study Report, comprehensive post construction monitoring has been identified to determine if disturbance effects are occurring for Late Winter Raptor Wildlife Habitats. Should disturbance effects be identified, MNR will be consulted, and mitigation techniques will be employed in accordance with commitments outlined in the Environmental Impact Study Report. MNR, in cooperation with Windelectric Inc., and any relevant agencies, will review the post construction monitoring reports in conjunction with relevant science to develop approaches to minimizing impacts should they occur.

MNR is providing this confirmation letter based on the review of the information provided in your natural heritage assessment reports. Applicants should be aware of the transition provisions under section 62 of the amended Renewable Energy Approvals regulation and fulfill natural heritage assessment requirements accordingly.

Where specific commitments have been made by the applicant in the natural heritage assessment with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNR expects that these commitments will be considered in MOE's Renewable Energy Approval decision and, if approved, be implemented by the applicant.

This confirmation letter is valid for the project as proposed in the natural heritage assessment and environmental impact study, including those sections describing the environmental effects monitoring plan and construction plan report. Should any changes be made to the proposed project that would alter the natural heritage assessment, MNR may need to undertake additional review of the natural heritage assessment.

In accordance with section 12(1) of the Renewable Energy Approvals Regulation, this letter must be included as part of your application submitted to the MOE for a Renewable Energy Approval.

If you wish to discuss any part of the confirmation or additional comments provided, please contact Eric R. Prevost, Renewable Energy Planning Ecologist, at (705) 755-3134.

Sincerely,

Karen Bellamy
District Manager
Peterborough District, MNR

cc. Vic Schroter, Environmental Assessment and Approvals Branch, MOE
Jim Beal, Southern Region Planning Unit, MNR

Natural Heritage Assessment & Environmental Impact Study

AMHERST ISLAND WIND ENERGY PROJECT
NATURAL HERITAGE ASSESSMENT &
ENVIRONMENTAL IMPACT STUDY

File No.: 160960595
November 2012

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

Executive Summary

Windlectric Inc. (Windlectric) is proposing to develop, construct, and operate the 56 - 75 megawatt (MW) Amherst Island Wind Energy Project (the Project) within Loyalist Township (the Township) in the County of Lennox and Addington (the County) in eastern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

The Project Study 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 Study 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 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 lineas 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.

Windlectric Inc. has retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). This Natural Heritage Assessment and Environmental Impact Study report has been prepared in

accordance with O. Reg. 359/09 and *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR 2011a). The Natural Heritage Assessment (NHA) report is provided to the Ministry of Natural Resources (MNR) for confirmation in advance of submission as part of the Renewable Energy Approval (REA) application to the Ministry of Environment (MOE).

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1.0 Introduction

1.1 PROJECT OVERVIEW

Windlectric Inc. (Windlectric) is proposing to develop, construct, and operate the 56 - 75 megawatt (MW) Amherst Island Wind Energy Project (the Project) within Loyalist Township (the Township) in the County of Lennox and Addington (the County) in eastern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

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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 lineas 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.

The Proponent has elected to assess and seek approval for some alternative Project configurations. The Renewable Energy Approval (REA) application process will consider:

- two alternative mainland transmission line routes;
- two alternative switching station locations and corresponding point of common coupling with the HONI line;
- three alternative mainland temporary dock locations along the mainland;
- a submarine cable with three alternative submarine cable routes near the mainland;
- three alternative mainland submarine cable landing locations and corresponding cable vault locations;
- up to three alternative met tower locations; and,
- up to four potential locations for an operations and maintenance building.

Final selection of the sites to be used would be based on the results of consultation activities, detailed design / engineering work, and the conditions experienced during construction.

1.2 REPORT REQUIREMENTS

This Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) report has been prepared in accordance with Ontario Regulation 359/09 (O. Reg. 359/09) and *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR 2011a). The NHA/EIS report is provided to the Ministry of Natural Resources (MNR) for confirmation in advance of submission as part of the Renewable Energy Approval (REA) application to the Ministry of Environment (MOE).

This NHA utilizes the definition of Project Location as provided in Section 2.3 of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR 2011a). As per the definition in the REA regulation, a renewable energy Project Location includes: "…*a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the Project and any airspace in which a person is engaging in or proposes to engage in the Project".*

A renewable energy Project includes all activities associated with the construction, installation, use, operation, maintenance, changing or retiring of the renewable energy generation facility. Therefore, for the purposes of measuring the distance from the Project Location to a natural feature, a Project Location boundary is considered to be the outer limit where site preparation and construction activities will occur and where infrastructure will be located (e.g. temporary structures, lay down areas, storage facilities, generation equipment, access roads, etc.).

In addition, for consultation purposes a 'Study Area' has also been defined (**Figure 1A, Appendix A**). The Study Area is an area that encompasses the Project Location and uses existing roadways to define the spatial limit of the boundary. The Project Study Area includes

Amherst Island and 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 Study 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.

An NHA is required to determine whether any of the following natural heritage features exist in and/or within 120 m of the Project Location:

- Wetlands and Coastal Wetlands
- Woodlands;
- Valleylands;
- Wildlife habitat;
- Life Science Areas of Natural and Scientific Interest (ANSIs), or within 50 m of an Earth Science ANSI;
- Natural features in specified provincial plan areas; and,
- Provincial parks and conservation reserves.

In accordance with O. Reg. 359/09, the Project Location includes all land and buildings/structures associated with the Project and any air space in which the Project will occupy. This includes structures such as turbines, access roads and power lines as well as any temporary work areas (the ‘constructible area’ for the Project) which are required to be utilized during the construction of the Project.

This report identifies the presence and boundaries of all natural features in and within 120 m of the Project Location based on a review of background records (Section 2) and on-site field investigations (Section 3). An Evaluation of Significance was then completed for each identified feature based on either an existing MNR designation of the feature or by using evaluation criteria or procedures established or accepted by the MNR (Section 4). Where the Project Location is in or within 120 m of a significant or provincially significant natural feature based on the evaluations of significance, an environmental impact study was completed which identifies and addresses, through mitigation, any potential negative environmental effects of the Project (Section 5).

For the purposes of verifying the accuracy of the Records Review and to identify any additional natural features, a ‘Zone of Investigation’ has been identified based on the requirements of O. Reg. 359/09 and the NHA Guide for Renewable Energy Projects (MNR 2011a).

The Zone of Investigation encompasses the Project Location plus an additional 120 m surrounding the Project Location (**Figure 1A, Appendix A**) and is the area within which site-specific field investigations were completed to:

- Verify whether the analysis of the Project Location undertaken through the Records Review is accurate, and make any necessary corrections to the determinations in the Records Review report;
- Determine whether any additional natural features exist in or in or within 120 m of the Project Location, other than those identified in the Records Review report;
- Determine the boundaries of any natural feature located in or in or within 120 m of the Project Location (identified through the Records Review report or during Site Investigation); and,
- Determine the distance from the Project Location to the boundaries of any natural features.

This ensures that any negative environmental effects that may result from construction, operation, and decommissioning of the Project will be assessed within this report as per the requirements of O. Reg. 359/09.

The results of the NHA/EIS are consolidated into this report, which is being submitted to MNR for confirmation in advance of submission of the REA application to the MOE. Written confirmation from the MNR, as well as any written comments received from the MNR, must be submitted along with the NHA/EIS to the MOE as part of the REA application.

1.3 GUIDANCE DOCUMENTS

During the preparation of this report, several guidance documents were referenced to ensure compliance with current standards and agency requirements. These documents include:

- NHA Guide for Renewable Energy Projects (MNR 2011a)
- Bats and Bat Habitats Guidelines for Wind Power Projects (MNR 2011b)
- Birds and Bird Habitats Guidelines for Wind Power Projects (MNR 2011c)
- Significant Wildlife Habitat Technical Guide (SWHTG) and Appendices (MNR 2000)
- Ontario Wetland Evaluation System, Southern Manual (MNR 2002)
- Draft Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (MNR 2012)

2.0 Records Review

2.1 METHODS

This Records Review report was prepared in accordance with O. Reg. 359/09, s. 25 (3).

Background data were collected and reviewed to identify natural features located in, or within, 120 metres of the Project Location (i.e., the Zone of Investigation). Documents reviewed and agencies contacted as part of the Records Review included but were not limited to:

- Ontario Ministry of Natural Resources (MNR). Natural heritage data request and proposed Site Investigation work program submitted May 12, 2011. 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;
- 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;
- Renewable Energy Atlas: bat hibernacula mapping (LIO 2012);
- Ontario Parks Planning and Management Information (http://www.ontarioparks.com/english/plan-res.html).
- Historic air photos of Amherst Island (Northway-Photomap Remote Sensing Ltd 1948)

Conservation Authority

- Cataraqui Region Conservation Authority/Loyalist Township. Letter sent to Planner/Chief Building Official of Loyalist Township and copied to General Manager of CRCA on September 16, 2008. Response and screening maps received from Development Officer of CRCA September 26, 2008;
- Letter from Cataraqui Region Conservation Authority (CRCA) to Windlectric Inc. dated March 28, 2011;
- Background information request sent to the General Manager at CRCA on August 17, 2011;
- Windlectric and Stantec met with CRCA representatives on October 6, 2011;
- Cataraqui Region Conservation Authority mapping (2011);

- Cataraqui Region Conservation Authority. Natural Heritage Study Final Report. August 2006.
- Owl Woods Management Strategy (Ecological Services 2011)

Local Municipal Government

- Letter sent to Planner/Chief Building Official of Loyalist Township;
- Windlectric and Stantec met with Loyalist Township representatives on October 6, 2011;
- Loyalist Township Official Plan (2010) and associated Schedules A and B.

Other data sources

- Important Bird Areas (IBA) database (Bird Studies Canada and BirdLife International, undated);
- Ontbirds Archives;
- eBird Canada Checklist;
- Various wildlife atlases (birds, mammals, amphibians and reptiles);
- 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;
- Geographic and Habitat Fidelity in the Short-eared Owl (*Asio flammeus*) (Keyes 2011); including specific information regarding Short-eared Owls breeding on Amherst Island;
- Amherst Island Beacon Archives;
- Discussion with local bird expert Janet Scott regarding owl populations on Amherst Island;
- Golder and Associates. Report on Fall Migration Bird Monitoring on Amherst Island, Ontario. October 2008. Addendum to Fall Migration Bird Monitoring on Amherst Island, Ontario. December 2008.

A summary of agencies contacted, information requested and responses received is provided in **Table 1B, Appendix B**.

The information received from each source and the manner in which it was used to identify natural features, provincial parks or conservation reserves that exist in or within 120 m of the Project Location (50 m for Earth Science ANSIs) is presented in **Section 2.2.5 to 2.2.7**.

2.2 RESULTS

A review of available background information has indicated the presence of known natural features occurring within the Study Area. The results of the Records Review search were used to determine whether the Project Location is in a natural feature, within 50 m of an Earth Science ANSI, or within 120 m of other natural features (as defined in Section 1.2). The locations of these features, including the boundaries of all natural features relative to the Project Location, are provided in **Figure 1B, Appendix A**, and described in the following sections.

2.2.1 Wetlands

2.2.1.1 Provincially Significant and Coastal Wetlands

A review of the NHIC database, LIO mapping and CRCA mapping identified three Provincially Significant Coastal Wetlands within the study area on Amherst Island (MNR 2011a; LIO 2012; CRCA 2006). Each is depicted on **Figure 1B, Appendix A**. These include:

- Nut Island Duck Club Marsh: this is a 114 ha coastal wetland composed of two wetland types including 60% swamp and 40% marsh (CRCA 2006). This wetland is within 120 m but does not overlap with the Project Location.

- Wemps Bay Marsh: this is a 43 ha coastal wetland composed of two wetland types including 19% swamp and 81% marsh (CRCA 2006). Wemps Bay Marsh is within 300 m of the Project Location, but does not occur within the 120 m Zone of Investigation.

- Long Point Marsh: this 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 (as discussed in Section 2.2.5). This wetland is within 120 m but does not overlap with the Project Location.

2.2.1.2 Locally-Significant Wetlands

The known wetlands (both Provincially Significant and unevaluated wetlands) and watercourses within the Study Area have been identified as ‘Environmentally Sensitive’ according to Schedule B of the Loyalist Township Official Plan (Loyalist Township 2010). However, the Township, nor the CRCA or MNR, has identified any wetlands within the Study Area as locally significant.

2.2.1.3 Unevaluated Wetlands

The data review also identified numerous unevaluated wetlands within the Amherst Island and one unevaluated wetland in the mainland study areas (LIO 2012) that are located within 120 m of the Project Location. Unevaluated wetlands identified through the Records Review are shown in Figure 1B, Appendix A.

2.2.1.4 Summary

The Project Location does not overlap with any unevaluated wetlands or PSWs identified in the Records Review. Several unevaluated wetlands have been identified within 120 m of the Project Location, and the Project is located within 120 m of two Provincially Significant Coastal Wetlands (Nut Island Club Marsh and Long Point Marsh). One additional Provincially Significant Coastal Wetlands (Wemps Bay Marsh) is located within the Study Area, but outside of the 120 m Zone of investigation (**Figure 1B, Appendix A**). The wetlands located within 120 m of the Project Location will be carried forward to the site Investigation. Site investigations will be undertaken to also identify any previously unknown wetland features in or within 120 m of the Project Location.

2.2.2 Woodlands

Woodlands are defined as treed areas, woodlots or forested areas other than cultivated fruit or nut orchards or Christmas tree plantations that are located east and south of the Canadian Shield (MNR 2011a).

A review of aerial photos and the Loyalist Township Official Plan (Loyalist Township 2010) of the Study Area indicate that it is predominantly agricultural. However, the CRCA has mapped woodlands and significant woodlands throughout Loyalist Township including the Study Area (CRCA 2006). For woodlands on Amherst Island, the CRCA study utilized a 4-hectare minimum threshold when determining significance based on size. This 4-hectare threshold was determined based on the 5–15% total percent woodland cover on Amherst Island alone as opposed to the total woodland cover within Loyalist Township. Most of the woodlands within the Study Area were determined to be significant based on size. Fewer woodlands met other significance criteria including presence of interior habitat, connectivity and age (CRCA 2006).

Historical air photos of Amherst Island indicate that in 1948 the island had significantly less woodland cover, and many of the woodlands on the island are younger than 64 years old (Northway-Photomap Remote Sensing Ltd. 1948). Agriculture was the predominant land use on the island. Woodland cover has increased since this time on the island likely due to changes in property ownership and management.

Based on the data review, several significant woodlands are located within the Study Area and with multiple significant and non-significant woodlands located in or within 120 m of the Project Location.

Woodlands and significant woodlands, as identified through the Records Review, are shown in **Figure 1B, Appendix A**.

The boundaries of the known woodlands as well as any additional woodlands will be verified during the Site Investigation.

2.2.3 Valleylands

Valleylands are linear natural areas that occur in a valley or other landform depression that have water flowing through or standing for some period of the year (MNR 2011a).

The identification and evaluation of significant valleylands based on the recommended criteria from MNR (i.e. surface and groundwater functions, landform prominence, ecological features and functions) is typically the responsibility of municipal planning authorities. Under O. Reg 359/09 proponents engaging in a renewable energy project must identify the presence and boundaries of valleylands that occur in or within 120 m of the Project Location.

For the purposes of this report, criteria as outlined in the NHA Guide were applied to assist in the identification of valleylands (MNR 2011a). For well-defined valleys, the physical boundary of the valleyland is defined by the stable top-of-bank or predicted top-of-bank. For less well-defined valley or stream corridor, the physical boundary may be defined in a number of ways including the consideration of riparian vegetation, the flooding hazard limit, the meander belt, or the highest general level of seasonal inundation.

Based on the data review, there are no known significant valleylands within the Project Location or Study Area (CRCA 2006). However, the presence of many watercourses within the Study Area suggests that valleylands may be present. These areas in or within 120 m of the Project Location will be considered during the Site Investigation.

2.2.4 Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle and that are important to migratory and non-migratory species. The Draft Significant Wildlife Habitat Ecoregion 6E Criterion Schedule groups wildlife habitat into four categories:

- Seasonal concentration areas of animals;
- Rare vegetation communities or specialized habitat for wildlife;
- Habitat for species of conservation concern; and
- Animal movement corridors.

Air photo interpretation indicates that the Project Location is largely comprised of cultural meadow and agricultural land consistent with the dominant landscape condition of Amherst Island. Natural wildlife habitat found in or within 120 m of the Project Location primarily includes two limited areas around Long Point Marsh Provincially Significant Coastal Wetland and Nut Island Duck Club Provincially Significant Coastal Wetland (LIO 2012; NHIC 2010). Outside of these features, potential natural wildlife habitat may occur within the periphery of several wooded areas in the western and eastern portion of the island containing, in part, unevaluated

wetlands (**Figure 2, Appendix A**). In addition to natural areas, several areas of cultural origin (e.g. meadows) are also likely to provide wildlife habitat.

The Amherst Island Important Bird Area (IBA) encompasses the entire island and adjacent off-shore areas. It has been designated as globally and continentally significant for congregating species, including spring and fall staging waterfowl. Although IBA designation is not recognized from a provincial or federal regulatory perspective, special attention has been given to the IBA in this assessment. Specifically, the IBA has been designated for the high numbers of Brant Geese recorded in off-shore waters surrounding the island during their fall migration (IBA Canada undated). Large numbers of shorebirds, specifically Dunlin, have also been recorded along the Amherst Island shorelines. The IBA report also makes mention of the large concentration of wintering raptors and owls on Amherst Island, including Short-eared Owls, a species of Special Concern (IBA Canada undated). Owl Woods is a well-known area for congregations of wintering owls on Amherst Island.

An additional known area of particularly high landbird concentration is located approximately 18 km southwest of the Study Area, at the Prince Edward Point Bird Observatory, located within the Prince Edward Point IBA. Wolfe Island is also an IBA, located approximately 6 km east of the Study Area, and it is known for high landbird and waterfowl concentrations.

Secondary source data were used to determine potential wildlife use of the Study Area. Inventories of wildlife that have been recorded as occurring within the range of the Amherst Island Wind Study Area were compiled from available literature and resources including the Atlas of the Mammals of Ontario (Dobbyn 1994), the Ontario Herpetofaunal Summary (Oldham and Weller 2000), the Ontario Breeding Bird Atlas (Cadman et al. 2007), and Birds of the Kingston Region (Weir 2008). The potential for species to be present within the Study Area will be limited by the habitat suitability and availability supported by the Study Area. Therefore the identified species recorded from these databases may not occur within the Amherst Island Wind Study Area.

2.2.4.1 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The Draft Significant Wildlife Habitat Ecoregion 6E Criterion Schedule identifies 16 potential types of seasonal concentration areas (MNR 2012).

As defined in the MNR guidance, the 16 types of seasonal concentrations are:

- waterfowl stopover and staging areas (terrestrial);
- waterfowl stopover and staging areas (aquatic);
- shorebird migratory stopover areas;

- raptor wintering areas;
- bat hibernacula;
- bat maternity colonies;
- bat migratory stopover areas;
- turtle wintering areas;
- snake hibernacula;
- colonially-nesting bird breeding habitat (bank and cliff, tree/shrubs, and ground);
- migratory butterfly stopover areas;
- landbird migratory stopover areas;
- deer yarding areas; and
- deer winter congregation areas.

A review of background information to assess the potential for seasonal concentration areas associated with southern Ontario to be supported in the Study Area is provided below.

Waterfowl Stopover and Staging Areas

Areas generally considered candidate significant wildlife habitat for waterfowl staging areas are very large wetlands, associated with lakes that generally have a diversity of vegetation communities interspersed with open water (MNR 2000). Marshes along Great Lakes shorelines are considered particularly valuable (MNR 2000). Amherst Island is noted in Appendix K of the Significant Wildlife Habitat Technical Guide (MNR 2000) as being significant for waterfowl migration.

Terrestrial

The Records Review did not identify known occurrences of waterfowl concentrations in terrestrial habitat on the island. However, a review of aerial photography suggests meadow habitat which may flood in the spring, suitable for foraging geese or dabbling ducks, is present.

Site investigations were conducted to determine whether this type of seasonal concentration area is supported in or within 120 m of the Study Area (see Section 3.0).

Aquatic

The Amherst Island IBA report lists Atlantic Brant Staging in large numbers (~2000-5000) in the area north of Amherst Island (IBA Canada undated). Cataraqui Region Natural Heritage Study of Loyalist Township shows migratory waterfowl sites surrounding Amherst Island, with two shown in the North Channel Bay of Quinte between Amherst Island and the mainland (CRCA 2006).

Christmas Bird Count (National Audubon Society 2010) data indicate 25 waterfowl species observed over 16 non-consecutive years of counts. Brant and King Eider were not observed within the past ten years, resulting in a total of 23 species observed in the last ten consecutive years (2000 through 2010). Count data show large numbers of Canada Geese (average count per hour 43.1, 10 year average number observed 868) and Common Goldeneye (average count per hour 39.3, 10-year average number observed 966).

Shorebird Migratory Stopover Areas

Relatively undisturbed shorelines along the Great Lakes that produce abundant food (clams, insects, snails and worms) are used by shorebirds during migration (MNR 2000). The Amherst Island Wind Study Area is located along a Great Lakes shoreline and is considered to be located in an area that may include candidate significant wildlife habitat for a shorebird stopover area.

The KFN (pers comm 2011) have regularly recorded shorebirds staging on the Amherst Bar at the eastern tip of the island, and this is likely the most significant habitat on the island (**Figure 1B, Appendix A**). The IBA report (undated) cites up to 1000 Dunlin which were recorded on the island in 1997. The Amherst Bar is located over 500 m east of the Project Location.

Raptor Wintering Area

Hay fields, pastures and open meadows that support large and productive small mammal populations can provide critical winter feeding areas (MNR 2000). The best roosting sites are typically found in relatively mature mixed or coniferous woodlands that abut windswept fields, with scattered trees and fence posts providing perches for hunting (MNR 2000).

According to the Important Bird Area (IBA) report (IBA Canada undated), Amherst Island has gained international recognition for concentrations of wintering hawks and owls that are often present. Up to 10 species of owls have been recorded during a single winter. Some peak numbers include: 34 Great Gray Owls (February 1979), 27 Great Gray Owls (March 1996), 3 Boreal Owls (November 1996), 21 Snowy Owls (1980s), 50 Long-eared Owls (1979) and 86 Rough-legged Hawks (1985). In the 1970s and 1980s, over 70 Short-eared Owls were seen in many winters. This species of conservation concern has also bred on Amherst Island in July 1973, when 30 individuals were counted.

The Owl Woods, an undefined area on the eastern end of Amherst Island, is a known winter owl concentration area (**Figure 1B, Appendix A**). Although Owl Woods itself has no defined boundary, the wooded area is owned by CRCA and four private landowners. There is a trail system through the woods that allows public access, with visitor numbers peaking during the winter months. The 120 m Zone of Investigation includes portions of deciduous forest and thicket. The pine plantation, where the majority of roosting owls can be observed, is located outside of the 120 m Zone of Investigation, approximately 500 m from the closest turbine

location; however, the deciduous forest in the north section of the Owl Woods is located within 120 m of the Project Location.

The KFN have been studying Owl Woods for many years, primarily through Bird Counts and it has been the subject of numerous articles in The Blue Bill, the periodical produced by the KFN. The base ecology of Owl Woods had not been reported on until the Owl Woods Management Strategy was produced in 2011. The general ecology is described as having small habitat types which are fragmented, heavily disturbed, lack biodiversity and attractive to invasive species. The management plan states that most of the Ecological Land Classification (ELC) types are cultural ones, and the natural vegetation class (which was identified as Dry-Fresh Sugar maple – White Ash Forest Type, FOD5-8) is very common in Ontario.

Generally the Owl Woods consists of three vegetation types; deciduous forest, a jack pine plantation and surrounding meadow and thicket habitat with scattered red cedars. Roosting owls are most commonly associated with the pine plantation and surrounding scattered red cedar. The Owl Woods is particularly known for its concentrations of Saw-whet Owls (*Aegolius acadicus*) and Long-eared Owls (*Asio otus*) during the winter. In some years, Boreal Owls are regularly observed in the woods. Barred Owls can occasionally be observed in the woods as well. These hunt for voles in the nearby fields, and use the conifers for thermal regulation and cover during the day, where they may be visible to visitors. Less frequently seen, or seen nearby are the Short-eared Owl, Great Horned Owl (*Bubo virginianus*), Snowy Owl (*Bubo scandiacus*), Great Gray Owl (*Strix nebulosa*) and most rarely, the Northern Hawk Owl (*Surnia ulula*). As reported in the Owl Woods Management Plan (Ecological Services 2011), population trends of Saw-whet and Great Gray numbers were stable. Numbers of Long-eared Owls and Barred Owls were increasing moderately, and Great Horned and Boreal were in moderate decline. Short–eared Owls are listed as a species of Special Concern, federally and provincially, but do not appear as dependent on Owl Woods as other species of owl (Ecological Services 2011).

Christmas Bird Count data show 19 species of raptor (including owl species) recorded in the last ten years of count data. The three most commonly observed raptors were Rough-legged Hawk (*Buteo lagopus*) with a 10-year average of 1.30 birds per hour, Red-tailed Hawk (*Buteo jamaicensis*) with a 10-year average of 1.02 birds per hour, and Northern Harrier (*Circus cyaneus*) with a 10-year average of 0.41 birds per hour. The most abundant owl species observed over the last ten years of CBC data was Long-eared Owl with a 10-year average of 0.45 birds per hour. Short-eared Owl was second with 0.32 birds per hour and Snowy Owl was third at 0.24 birds per hour (National Audubon Society 2010).

Environment Canada has compiled the results of winter bird surveys in 2006 from 17 sites in southern Ontario and concluded that only a few sites across southern Ontario provide the necessary conditions to support high numbers of wintering raptors. Amherst Island supported the highest number of raptors (3.14 raptors/kilometre) followed by Fisherville (2.14 raptors/kilometre) and then Wolfe Island (1.4 raptors/kilometre). The remainder of the sites

supported raptor densities that were an order of magnitude less than these three sites (Environment Canada 2007).

Bat Hibernacula

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.

No known bat hibernacula have been identified within 1 km of the 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 Study Area.

Bat Maternity Colonies

Depending on the species, maternity roosting colonies for bats can include tree foliage, tree cavities and crevices under loose bark, or buildings. There are no known maternity roosts in the Study Area.

Bat Migratory Stopover Areas

Stopover areas for long distance migrant bats, including Hoary Bat, Eastern Red Bat and Silver-haired Bat, are important during fall migration. Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown.

No known migratory stopover areas occur within the Study Area. Because criteria have not been developed for this habitat in this Ecoregion to date, it is not possible to further assess this habitat (MNR 2012). Therefore this feature will not be carried forward into the Site Investigation.

Turtle Wintering Areas

Wintering areas for turtles are generally the same general area as their core habitat: water that is deep enough not to freeze, with soft mud substrate (MNR 2012). Candidate turtle overwintering habitat is defined as permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen (MNR 2012).No known turtle wintering areas occur within the Study Area.

Snake Hibernacula

Potential hibernacula are overwintering areas that include features such as animal burrows, rock crevices, fractured rocks at the base of cliffs or karst areas that provide an access for reptiles to hibernate below the frost line (MNR 2000). These areas are often associated with water to prevent desiccation of the species.

Many of Ontario's reptile species only occur in the southern most parts of the province and the Project is located within the ranges of several common species of snakes (Oldham and Weller 2000). The Records Review did not identify any known reptile hibernacula in or within 120 m of the Project Location.

Colonial Bird Nesting Sites (bank/cliff, tree/shrub and ground)

Colonial bird nesting sites can be located in swamps and along large bodies of water for herons, islands for gulls and cliffs, and in banks and artificial structures for swallows (MNR 2000).

The Central Cataraqui Region Natural Heritage Study of Loyalist Township shows two colonial water birds sites on Amherst Island, one of which is a heronry used by Great Blue Herons located in the Long Point Marsh, and the second of which is located in the Nut Island Club Wetland at the southwest corner of the island. These wetlands are identified on **Figure 1B, Appendix A**. There are records of Black-crowned Night Herons on Amherst during the breeding season (KFN pers comm 2011); these individuals may nest on the bar at the eastern tip of the island (the Amherst Bar), or on the Brother Islands, a small group of islands, to the northeast.

The MNR confirms that there is a known nesting site/colony used by Herring Gulls, Common Terns, and Double-crested Cormorants located on the Brother Islands (which is approximately 2 km off the northeast shore of Amherst Island; **Figure 1B, Appendix A**).

The Breeding Bird Atlas of Ontario (Cadman et al. 2007) has records of colonial swallow species on Amherst Island, suggesting swallow colonies may occur within the Study Area.

Migratory Butterfly Stopover Areas

During fall migration, monarchs tend to move along the north shore of the Great Lakes (Calvert 2001). Fields and other open areas with a variety of habitat types that are found within 5 km of the Lake Erie or Lake Ontario shoreline are considered candidate significant wildlife habitat for migratory butterfly stopover areas (MNR 2000).

The Study Area is located along the northern shoreline of Lake Ontario and therefore may contain candidate significant wildlife habitat for migratory butterflies; however, no known records of significant migratory butterfly stopover areas were found.

Landbird Migratory Stopover Areas

Migratory passerines are known to use forested landscapes along Great Lakes shorelines as stopover sites during spring and fall migration (Potter et al. 2007; MNR 2000). Landbirds tend to concentrate at tips of peninsulas, congregating in significant numbers at known significant stopover sites including Point Pelee and Long Point in Lake Erie, while raptors and shorebirds concentrate along the Great Lakes during migration. Areas that provide a diversity of habitat types ranging from open grasslands to large woodlands within 5 km of the Lake Erie or Lake Ontario shorelines are considered potential candidate significant wildlife habitat for migrating landbird stopover areas (MNR 2000).

The Amherst Island Project is located adjacent and along the Lake Ontario shoreline and as such, the Study Area may include areas that would constitute candidate significant wildlife habitat for a migratory landbird stopover.

Deer Yarding Areas

Deer yards are areas of key winter habitat for White-Tailed Deer. They usually consist of a core area of coniferous forest, which provides shelter from snow and wind, adjacent to an area of deciduous forest or other foraging habitat (MNR 2012).

MNR undertakes the identification and delineation of deer yards. Given the absence of designated deer yards, no candidate significant wildlife habitat for deer yards occurs in or within 120 m of the Project Location. Therefore, this habitat will not be carried forward to the Site Investigation.

Deer Winter Congregation Areas

Deer winter congregation areas are applicable in the southern areas of Ecoregion 6E where deer movement in the winter is not constrained by snow depth, but where deer congregate in suitable woodlands to reduce or avoid winter conditions. Forested or treed swamp ecosites >100 ha in size or smaller conifer plantations are considered candidate significant wildlife habitat (MNR 2012).

MNR undertakes the identification and delineation of significant deer winter congregation areas. None were found in or within 120 m of the Project Location. Therefore, this habitat will not be carried forward to the Site Investigation.

Seasonal Concentration Areas Summary

Site investigations are required to determine whether the above features (with the exception of bat migratory stopover areas, deer yarding areas and deer winter congregation areas) exist in or within 120 m of the Project Location, and whether additional features exist other than those identified. This includes determining whether the critical habitat features required to support

these concentration areas are present in the Study Area. Results of these further investigations are provided in the Site Investigation (Section 3.0).

2.2.4.2 Rare Vegetation Communities or Specialized Habitats

Rare Vegetation Communities

The Significant Wildlife Habitat (SWH) Ecoregion 6E Criterion Schedule identifies the following features as rare vegetation communities:

- Cliffs and talus slopes;
- Sand barren;
- Alvar;
- Old growth forests;
- Savannah;
- Tallgrass prairie; and
- Other rare vegetation communities listed in Appendix M of the SWHTG.

The rolling, poorly drained topography of Amherst Island is not conducive to rare vegetation communities such as alvar, prairie, savannah, rock barren and sand barren; there are no records of these community types from within the Study Area.

A review of aerial photography suggests great lake dunes may occur along the western shore of Amherst Island. However, potential dunes do not occur within 120 m of the Project Location.

Several woodlands occurred within 120 m of the Project Location.

Old growth forests are characterized by having a large proportion of trees in older age classes, many of them over 120 to 140 years old (MNR 2000). These forest stands are rare throughout Ontario, particularly in southern Ontario, largely due to past logging practices. Old (i.e. more than 120 years old) undisturbed forest stands that have experienced little or no forestry management would be considered candidate significant wildlife habitat. The Central Cataraqui Region Natural Heritage Study (2006) maps woodlands estimated to be greater than 100 years old (**Figure 1B, Appendix A**). There are three woodlands greater than 100 years old found within 120 m of the Project Location.

Results of the site investigations will determine the presence of rare vegetation communities within 120 m of the Project Location.

Specialized Habitats

Specialized habitats are microhabitats that are critical to some wildlife species. The Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012) identify the following potential specialized habitats:

- waterfowl nesting areas;
- bald eagle and osprey nesting, foraging, and perching habitat;
- woodland raptor nesting habitat;
- turtle nesting areas;
- seeps and springs; and
- amphibian breeding habitat (woodland and wetland).

A review of background information to assess the potential for specialized habitats that are associated with southern Ontario to be supported in the Study Area is provided below.

Waterfowl Nesting Areas

Waterfowl nesting habitat typically includes upland habitat that is located near marshes, ponds or lakes. Sites considered candidate significant wildlife habitat for waterfowl nesting typically contain a high density of small and medium sized ponds, or are single wetlands that are large and diverse (MNR 2000). Nesting waterfowl may be present in or adjacent to the three Provincially Significant Coastal Wetlands (PSW) and additional unevaluated wetlands located on Amherst Island.

Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat

The SWHTG indicates that some raptors require somewhat specialized habitats. Under the criteria and guidelines outlined in Appendix Q of the SWHTG, critical habitat features that would support specialized Bald Eagle and Osprey nesting habitat are identified as waterbodies with fish populations and trees with good visibility and flight lines.

Although not identified by the MNR or LIO, osprey nesting platforms on Amherst Island have attracted nesting osprey in the past (Weir 2008). The shoreline habitat on Amherst Island would provide foraging habitat for eagles and osprey.

The report *Conserving Lake Ontario and Upper St. Lawrence Bald Eagle Habitats* (St. Lawrence Bald Eagle Working Group 2008) was used to identify priority areas for Bald Eagle conservation on Amherst Island. Two areas were identified in this report: the Nut Island Duck Club Marsh and the large woodland in the northwest corner of the island. An additional historical bald eagle nesting site was identified in this report, located near the centre of the island, outside of the 120 m Zone of Investigation.

This nest was last observed in use in May 1955 (Bird Studies Canada, email correspondence, pers comm, Sept 4, 2012). The two priority areas have been identified in **Figure 1B, Appendix A**.

Woodland Raptor Nesting Habitat

The Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012) indicates that some raptors require somewhat specialized habitats. All natural or conifer plantation, woodland or forest stands greater than 30 ha with greater than 10 ha of interior habitat are considered candidate significant woodland raptor nesting habitat. During Ontario Breeding Bird Atlas field surveys, Red-tailed Hawk and Cooper's Hawk nesting was confirmed on Amherst Island (Cadman et al. 2007).

Turtle Nesting Habitat

Sandy or fine gravel soils in an open landscape setting with sparse vegetation are a requirement for turtle nesting (MNR 2000). Areas that would be considered candidate significant wildlife habitat for turtle nesting include areas containing sandy or fine gravel soils (e.g. shoreline beaches) in proximity or adjacent to wetland habitat occupied by turtles (MNR 2012).

The NHIC database included records for Northern Map Turtles on or near Amherst Island. Other turtles, not addressed through the Species at Risk Report, likely to occur on the island include Common Snapping Turtle and Midland Painted Turtle. Turtle nesting habitat was not identified through the Records Review.

Seeps and Springs

Seepage areas and springs provide habitat for numerous uncommon species and may support a high diversity of plant species (MNR 2000). In winter, these areas provide foraging opportunities for Wild Turkey and White-tailed Deer (MNR 2000). Those that occur within forested areas where the canopy maintains cool, shaded conditions are most important (MNR 2000). No seeps or springs were identified through the Records Review.

Amphibian Breeding Habitat (Woodland)

Woodland ponds may provide important habitat for local amphibian populations. Ponds that contain a variety of vegetation structure in and around the edge of the pond, are undisturbed and are found adjacent to closed canopy woodlands with dense undergrowth that maintain a damp environment typically provide the best ponds for breeding (MNR 2012).

The Ontario Herpetofaunal Summary (Oldham and Weller 2000) indicates the Project Study Area falls within the range of a number of common amphibian species, including Spotted Salamander, American Toad, Western Chorus Frog, Spring Peeper, Bullfrog, Northern Green

Frog, Northern Leopard Frog, and Mink Frog. Woodlands are present within the Study Area and may provide amphibian habitat.

Amphibian Breeding Habitat (Wetland)

Wetlands and pools >500 m^2 and isolated from woodlands are considered candidate significant wetland amphibian breeding habitat. Several common amphibian species are known to occur on Amherst Island (Oldham and Weller 2000) and suitable wetland breeding habitat is likely to occur within the Study Area.

Bullfrogs are found in deep, permanent water with abundant emergent plants and are considered area-sensitive, requiring at least 1 ha of suitable habitat (MNR 2000). No known bullfrog concentration areas were identified during the Records Review; however, potential habitat occurs in the coastal wetlands.

Rare Vegetation Communities and Specialized Wildlife Habitats Summary

Site investigations are required to determine whether the above features exist in or within 120 m of the Project Location, and whether additional features exist other than those identified above. This includes determining whether the critical habitat features required to support these areas are present in the Study Area. Results of these further investigations are provided in the Site Investigation (Section 3.0).

2.2.4.3 Habitat for Species of Conservation Concern

Species of conservation concern include four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk from certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe.

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

The Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012) identifies the following features as habitat for species of conservation concern:

- Marsh bird breeding habitat;
- Woodland area-sensitive bird breeding habitat;
- Open country bird breeding habitat;
- Shrub/early successional bird breeding habitat;
- Terrestrial crayfish; and
- Special concern and rare wildlife species;

Marsh Bird Breeding Habitat

Marsh breeding bird nesting occurs in wetlands with emergent aquatic vegetation (MNR 2012). During Ontario Breeding Bird Atlas field surveys, Pied-billed Grebe, American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Wilson Phalarope and Black Tern nesting was identified on Amherst Island (Cadman et al. 2007).

Bird Breeding Habitat (woodland area-sensitive, open country, and shrub/early successional)

Woodlands and grasslands of at least 30 ha are considered to have the potential to host populations of area-sensitive species (MNR 2012). Appendix C of the SWHTG (MNR 2000) contains a list of area-sensitive wildlife. Ontario Breeding Bird Atlas information indicates that the 10x10 km atlas squares that encompass the Study Area contain records of woodland, shrub/early successional, and grassland area sensitive breeding birds.

Information on the breeding birds of the Kingston Region has also been published by Ron D. Weir through the Kingston Field Naturalists (2008). Data provided in this book has been incorporated into the background information available for this report.

Woodland Interior Breeding Birds

Mature forests stands or woodlots greater than 30 ha with 4 ha of interior habitat are considered candidate woodland interior breeding bird habitat (MNR 2012). Several large woodlands occur within the Study Area that could meet the criteria to host populations of area-sensitive species.

Open Country Breeding Birds

Large, contiguous undisturbed grasslands of at least 30 ha (and preferably 50 ha or more) are considered likely to support and sustain a diversity of grassland species (MNR 2012). Agricultural habitat is found in the Study Area that could support grassland breeding bird species. Open country habitat contained in and within 120 m of the Study Area is generally

composed of actively hayed fields and grazed pasture; however, there are some cultural meadows. The farming practice of hay field cutting before the end of the breeding cycle for grassland birds can reduce breeding success for these species up to 94% and hayfields are not considered to support viable populations of grassland breeding bird species (COSSARO 2010); however, due to the importance of Amherst Island for bird migration and grassland species such as the Short-eared Owl, all hayfields, pastures, and cultural meadows have been assessed as candidate significant wildlife habitat.

Keyes (2011) in conjunction with the Kingston Field Naturalists has confirmed breeding Short-eared Owls on Amherst Island in the 2009 and 2010 (**Figure 1B, Appendix A**). Locations of the breeding territories described in this report were used to target Short-eared Owl surveys in 2011. Other grassland raptors likely be nest in the Study Area include the Northern Harrier.

The IBA account cites Amherst Island as a staging area for migrating swallows, citing numbers up to 15,000 individuals (IBA Canada undated). Swallows forage in open country areas, and although open country breeding bird habitat is related to breeding, the ecological function of this habitat supports swallow staging.

Shrub/Early Successional Breeding Birds

Shrub thicket habitats greater than 10 ha are most likely to support and sustain a diversity of shrub /early successional bird breeding species (MNR 2012). The background wildlife list (**Table 2B, Appendix B**) contains all eight bird species that are listed as indicator, common, and special concern shrub /early successional birds (i.e., Brown Thrasher, Clay-coloured Sparrow, Black-billed Cuckoo, Willow Flycatcher, Eastern Towhee, Field Sparrow, Yellow-breasted Chat, and Golden-winged Warbler) as per the Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012).

Terrestrial Crayfish

Terrestrial crayfish use meadow and the edges of shallow marshes to construct burrows (MNR 2012). The Canadian range of terrestrial crayfish is restricted to southwestern Ontario (MNR 2012). Amherst Island occurs outside of this known range. As such, they are not expected to occur within the Study Area, and this habitat will not be carried forward to the Site Investigation.

Rare Species

NHIC, wildlife atlases and information provided by MNR (personal communication 2011) was used to identify historic records of species of conservation concern that occur in the vicinity of the Study Area. Wildlife species that would be considered species of conservation concern and whose presence would be assessed within an evaluation of candidate significant wildlife habitat in the Study Area are listed in **Table 2B (Appendix B)**. This list of potential species of conservation concern and their habitat requirements was cross referenced with habitat

mapping, aerial photography and vegetation classifications to determine the suitability of the Study Area to support them.

Within the context of O. Reg 359/09, endangered and threatened species are addressed as part of MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (APRD) requirements. Information required as part of these requirements is being submitted to MNR as part of the Amherst Island APRD Report (separate cover). Where this information indicates that approvals or permits are required, these will be addressed separately through the applicable statute and its permitting process.

2.2.4.4 Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (MNR 2000).

The Central Cataraqui Region Natural Heritage Study (2006) maps linkages between areas of core habitat that would act as wildlife corridors. These corridors may be used by a variety of wildlife, in particular deer movement. However, no deer yarding areas or deer winter congregation areas were identified by the MNR on Amherst Island. Therefore, there can be no deer movement corridors identified based on the criteria provided in the Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012). These movement corridors also do not necessarily correspond to amphibian movement corridors between breeding wetlands and terrestrial habitats.

2.2.5 Areas of Natural and Scientific Interest (ANSIs)

MNR identifies two types of ANSIs; Life Science and Earth Science. Life Science ANSIs are significant representative areas of Ontario's biodiversity and natural landscapes, while Earth Science ANSIs are geological in nature and consist of some of the more significant representative examples of bedrock, fossils and landforms in Ontario.

Based on a review of the MNR data, Amherst Bay Life Science ANSI is located in the southern portion of the Study Area (LIO 2012; CRCA 2006). This 360 ha ANSI includes a large and undisturbed Coastal Wetland (Long Point Marsh) and shoreline complex with a large marsh, forested swamp and aquatic vegetation. The ANSI also includes coastal sand bar barrier features (CRCA 2006). The Project Location is not in this feature; however, a small portion of this ANSI is located within 120 m to the Study Area (**Figure 1A, Appendix A**).

2.2.6 Natural Features in Specified Provincial Plan Areas

The Project is not located within the Niagara Escarpment Plan Area, the Oak Ridges Moraine Conservation Plan Area or the Protected Countryside of the Greenbelt Plan. These will not be carried forward through to Site Investigation.

2.2.7 Provincial Parks and Conservation Reserves

There were no provincial parks or conservation reserves identified within 120 m of the Project Location through the Records Review (NHIC 2010). These will not be carried forward through to Site Investigation.

2.3 SUMMARY OF NATURAL FEATURES AND BOUNDARIES IDENTIFIED

Table 2.1 provides a summary of the natural features that will be carried forward to Site Investigation.

Table 2.1: Summary of Natural Features Identified in Records Review

Feature	Carried Forward to Site Investigation (Y/N)	Known Recorded Information
Wetlands	Y	Two provincially-significant coastal wetlands: Nut Island Duck Club Marsh and Long Point Marsh and several unevaluated wetlands located within 120 m of the Project Location.
Woodlands	Y	Numerous woodlands greater than 4 ha are located within 120 m of the Project Location. Site investigations are required to confirm the presence and boundaries of these woodlands.
Valleylands	Y	No records
Wildlife Habitat		
Seasonal Concentration Area		
• Waterfowl stopover and staging areas (terrestrial)	Y	No records
• Waterfowl stopover and staging areas (aquatic)	Y	Amherst Island IBA
• Shorebird migratory stopover areas	Y	Amherst IBA and KFN: shorebirds staging on the Amherst Bar at the eastern tip of the island
• Raptor wintering areas	Y	Amherst Island IBA and KFN: Amherst Island is known for large concentrations of wintering raptors, including owl. Owl Woods is a known roost
• Bat hibernacula	Y	No records
• Bat maternity colonies	Y	No records
• Bat migratory stopover areas	N	No records
• Turtle wintering areas	Y	No records
• Snake hibernaculum	Y	No records
• Colonial bird nesting sites (bank and cliff)	Y	No records
• Colonial bird nesting sites (tree/shrub)	Y	Heron nesting: Long Point Marsh, Nut Island Duck Club Marsh, Amherst Bar and Brother Islands
• Colonial bird nesting sites (ground)	Y	Herring Gulls, Common Terns, and Cormorants: nests located on the Brother Islands
• Migratory butterfly stopover areas	Y	No records
• Landbird migratory	Y	No records

Table 2.1: Summary of Natural Features Identified in Records Review

Feature	Carried Forward to Site Investigation (Y/N)	Known Recorded Information
stopover areas		
• Deer yarding areas	N	No records
• Deer winter congregation areas	N	No records
Rare Vegetation Communities or Specialized Habitat for Wildlife		
Rare Vegetation Communities		
• Cliffs and talus slopes • Sand barren • Alvar • Old growth forests • Savannah • Tallgrass prairie • Other rare vegetation communities listed in Appendix M of the SWHTG	Y	No records
Specialized Habitat for Wildlife		
• Waterfowl nesting area	Y	No records
• Bald Eagle and Osprey nesting, foraging, and perching habitat	Y	St Lawrence Bald Eagle Working Group: woodland in northwest and Nut Island Duck Club Marsh
• Woodland raptor nesting habitat	Y	Red-tailed Hawk and Cooper's Hawk nesting on Amherst Island
• Turtle nesting habitat	Y	No records
• Seeps and springs	Y	No records
• Amphibian breeding habitat (woodland)	Y	No records
• Amphibian breeding habitat (wetland)	Y	No records
Habitat for Species of Conservation Concern		
• Marsh Bird Breeding Habitat	Y	No records
• Bird Breeding Habitat (woodland area-sensitive)	Y	No records
• Bird Breeding Habitat (open country)	Y	Short-eared Owl breeding in grassland areas; significant swallow migration
• Bird Breeding Habitat (shrub/early successional)	Y	No records
• Terrestrial Crayfish	N	No records
• Special Concern and Rare Wildlife Species	Y	No records
Animal Movement Corridors		No records
• Amphibian Movement	Y	
• Deer Movement	N	

Table 2.1: Summary of Natural Features Identified in Records Review

Feature	Carried Forward to Site Investigation (Y/N)	Known Recorded Information
Areas of Natural and Scientific Interest (ANSI) • Life Science ANSI • Earth Science ANSI	Y	Amherst Bay Life Science ANSI
Specified Provincial Plan Areas	N	None present in the Study Area
Provincial Parks and Conservation Reserves	N	None present in the Study Area

3.0 Site Investigation

Site investigations were conducted in accordance with O. Reg 359/09, s. 26 (1), Natural Heritage Site Investigation. This report is prepared in accordance with s. 26 (3) with guidance provided from the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR 2011a).

Site investigations in support of this report were completed with the purpose of confirming the status and boundaries of natural features identified through the Records Review and identifying any additional features (**Section 3.1**). Data collected during the Records Review concerning natural features and species occurrences were used to guide the scope and direction of site investigations. The extent of the site investigation program and type of field surveys included in the program is directly reflective of the extent of natural features and triggers for significant wildlife habitat that are identified within the Study Area. The Project is primarily sited within actively farmed agricultural fields and has been sited outside of the majority of natural features in the Study Area.

Natural features that have the potential to occur in or within 120 m of the Project Location, as identified through the Records Review, are listed in **Table 2.1**. Site investigations are required to confirm the presence and delineate the boundaries of candidate significant wildlife habitat features within 120 m of the Project Location.

3.1 METHODS

The site investigations undertaken detailed the current conditions in and within 120 m of the Project Location, and were based on the information about the Project Location and siting that was current at the time of the respective survey. Survey dates, times, duration, field personnel and weather conditions are presented in **Table 4B, Appendix B**. All surveys conducted within the Study Area were completed by qualified personnel. Field notes from all Site Investigations are provided in **Appendix C**. Staff summaries and qualifications for personnel involved in conducting the site investigations are provided in **Appendix D**. Land access was available for all land parcels where Project components are proposed, and areas within 120 m of the Project Location were traversed on foot during site investigations where land access was available.

All site investigations were carried out in accordance with O. Reg. 359/09 and the NHA Guide for Renewable Energy Projects (MNR 2011a), using guidance provided in the SWHTG and the Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012).

3.1.1 Alternative Site Investigation Methods

Alternative site investigations consisted of assessments conducted from roadsides and property boundaries in locations within 120 m of the Project Location where access was not required. This occurred in locations where underground transmission lines are proposed within the road right-of-way and the adjacent property is active agriculture or residential property. Alternative site investigations, comprised of visual scans from roadsides and/or property boundaries in combination with air photos, were undertaken in these locations.

3.1.2 Vegetation Community and Vascular Plants Assessment

Ecological Land Classification (ELC) and preliminary botanical inventories of the vegetation communities in and within 120 m of the Project Location were conducted by Stantec on July 26-29, August 2-5, August 17-19, November 11, 2011 and March 27-28, May 18, and August 15, 2012.

Vegetation communities were delineated on aerial photographs and checked in the field. Vascular plant species lists were recorded separately for each community. 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). Specific emphasis was placed on searching for plant species of conservation concern identified through the records review with historical occurrences within the study area.

Plant species were considered rare if designated provincially as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable). Species having a high coefficient of conservatism (9 or 10) as designated by Oldham et al. (1995) were also considered species of note.

3.1.3 Wetland Confirmation and Delineation

Wetlands are defined in the REA regulation as features that are swamp, marsh, bog, or fen that are seasonally or permanently covered by shallow water or has the water table close to the surface, and have hydric soils and vegetation dominated by hydrophytic or water-tolerant plants (OMNR 2011a). Wetlands are identified during ELC surveys and are further evaluated using the Ontario Wetland Evaluation System (OWES).

Previously unidentified wetlands within 120 m of the Project Location identified during the course of the site investigations were delineated during the vegetation community assessment and vascular plant surveys described in **Section 3.1.2**. The wetland boundaries were mapped through reconciling aerial photographs and observations made during the site investigations in accordance with the methods outlined in the OWES Southern Manual (MNR 2002). James Leslie oversaw the wetland delineation and assessments (**Appendix D**).

3.1.4 Woodlands

Woodlands include treed areas, woodlots, or forested areas, other than cultivated fruit or nut orchards or plantations established for the purpose of producing Christmas trees (OMNR 2011a).

The limits of all woodlands that occur, or partially occur, in or within 120 m of the Project Location were delineated through aerial photo interpretation and confirmed during site investigations. Woodlands were delineated using the driplines of the trees. Information regarding woodland size, ecological function and uncommon characteristics was collected during ELC surveys and through GIS analysis. Historical air photos were used to determine the age and history of woodlands (Northway-Photomap Remote Sensing Ltd. 1948). Treed areas identified during vegetation surveys were compared to the definition of woodlands provided in O.Reg. 359/09 to delineate the limits of woodlands.

3.1.5 Valleylands

Valleylands are natural areas south and east of the Canadian Shield that have flowing or standing water for some period of the year. They are linear systems stretching across the landscape from headwater areas into other aquatic features such as lakes and wetlands. The boundaries of valleylands are defined based on their geomorphology, either by the stable top-of-bank, the flooding hazard limit, or limits of riparian vegetation. Conservation Authorities can provide regulated mapping and ELC surveys can provide further detail on these natural features. (OMNR 2011a)

Areas in and within 120 m of the Project Location were searched for the presence of characteristics of valleylands as defined within O. Reg. 359/09.

3.1.6 Areas of Natural and Scientific Interest (ANSI)

The Amherst Bay Life Science ANSI is located within 120 m of the Project Location and was identified in the Records Review.

3.1.7 Wildlife and Wildlife Habitat

Site investigations to determine the presence of candidate significant wildlife habitat were conducted by Stantec on July 26- 29, August 2-5, August 17-19, November 11, 2011 and March 27-28, May 18, and August 15, 2012. Survey information (i.e., survey times, weather conditions and field personnel) is summarized in **Table 4B, Appendix B**.

Site investigations focused on determining whether candidate significant wildlife habitats, as identified during the Records Review, have the potential to occur in or within 120 m of the Project Location. Criteria used to identify candidate significant wildlife habitat were derived from the Significant Wildlife Habitat Technical Guide (MNR 2000) and the Draft SWH Ecoregion 6E

Criterion Schedule. Specific emphasis was placed on determining whether the critical habitat features required to support significant wildlife habitat were present in natural features in or within 120 m of the Project Location.

3.1.7.1 Seasonal Concentration Areas of Animals

Seasonal concentration areas are areas where wildlife species occur in aggregations at certain times of the year, on an annual basis. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. In spring and autumn, migratory wildlife species will concentrate where they can rest and feed. Other wildlife species require habitats where they can survive winter. Seasonal concentration area habitats have been identified by using the habitat criteria found in the SWHTG (MNR 2000) and Draft Significant Wildlife Habitat: Ecoregion 6E Criteria Schedules (MNR 2012). The habitat criteria for each potential seasonal concentration area, and methods employed to identify them in and within 120 m of the Project Location, have been summarized in **Table 3.1**.

Table 3.1: Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
Waterfowl Stopover and Staging Area (Terrestrial)	• Fields with sheet water during Spring (mid-March to May) or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). • Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH.	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support waterfowl stopover and staging areas (terrestrial). • ELC surveys and GIS analysis of the landscape were used to identify large wetlands or marshes with a diversity of vegetation communities interspersed with cultural meadows that flood each spring (terrestrial staging areas). • All potential waterfowl stopover and staging areas (including CUM, CUT, and hay and pasture agricultural fields) were searched in early spring 2011 for evidence of spring flooding. Subsequent transects and points counts were conducted in those areas with spring flooding. • Areas with no evidence of spring flooding were not considered candidate waterfowl stopover and staging habitat.
Waterfowl Stopover and Staging Area (Aquatic)	• The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration • These habitats have an abundant food	• Vegetation community classifications were utilized to assess features within 220 m of the Project Location that would support waterfowl stopover and staging areas (aquatic). • ELC surveys and GIS analysis of the landscape were used to identify large

Table 3.1: Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	supply (mostly aquatic invertebrates and vegetation in shallow water) • The combined area of the ELC ecosites and a 100 m radius area is the SWH. • Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify.	wetlands or marshes with a diversity of vegetation communities interspersed with open water (aquatic staging areas). • Only those communities that contain standing water for a portion of the year were considered candidate SWH.
Shorebird Migratory Stopover Area	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of amour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a significant wildlife habitat. • The following community types: Meadow Marsh (MAM), Beach/Bar (BB), or Sand Dune (SD)	• The shoreline of Lake Ontario, apart from residential areas, was considered candidate habitat. • The presence of shorebird migratory stopover areas within suitable ELC communities was assessed.
Raptor Wintering Area	• Presence of fields and woodlands. i.e. at least one of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in addition to one of the following Upland Community Types: Meadow (CUM), Thicket (CUT), Savannah (CUS), Woodland (CUW) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors. • The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites need to be > 20 ha with a combination of forest and upland, • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15 ha) with adjacent woodlands. • Upland habitat (CUM, CUT, CUS, CUW), must represent at least 15 ha of the 20 ha minimum size.	• Vegetation community classifications and size calculations were utilized to assess features within 120 m of the Project Location that would support raptor wintering areas.
Bat Hibernacula	• Hibernacula may be found in caves, mine shafts, underground foundations and karsts. • May be found in these Community Types: Crevice (CCR), Cave (CCA).	• Specialized site investigations were conducted to identify potential bat hibernacula. • A search of karst features and abandoned mines found within 1120 m of the Project Location was conducted

Table 3.1: Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
		with data obtained through Ministry of Northern Development and Mines.
Bat Maternity Colonies	• Maternity colonies considered significant wildlife habitat are found in forested ecosites. • Any of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM), or Deciduous Swamp (SWD) that have>10/ha wildlife trees >25cm diameter at breast height (dbh). • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support bat maternity colonies. • Specialized site investigations were conducted to identify potential bat maternity colonies. • Wooded areas were traversed and the presence and frequency of features that may support maternity colonies of bats were recorded.
Turtle Wintering Areas	• Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO). • Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat. • For most turtles, wintering areas area in the same general area as their core habitat. • Water has to be deep enough not to freeze and have soft mud substrate. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support turtle wintering areas. • Specialized site investigations were conducted to identify potential turtle wintering areas.
Snake Hibernacula	• Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. • Wetlands such as conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover can be important over-wintering habitat. • Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA),	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support snake hibernacula. • Specialized site investigations were conducted to identify potential snake hibernacula. Surveys for snakes and associated hibernacula features were conducted throughout natural feature communities and hedgerows. • Habitat features that would provide an underground route, act as a potential hibernacula including exposed rock

Table 3.1: Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	crevices or inactive animal borrows were recorded.
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	• Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (CUM), Thicket (CUT), Bluff (BL), Cliff (CL). • A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation.	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support colonial bird breeding habitat. • Open habitats near bodies of water were scanned man-made structures (e.g. concrete bridges, buildings, nesting boxes) suitable for and with evidence of previous use by nesting swallows. Hills with exposed substrate, including river banks, were also scanned for holes indicative of a Bank Swallow nesting colony.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	• Any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET). • The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree.	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support colonial bird breeding habitat. • Large areas of marsh or swamp habitat with live or an abundance of dead trees, within 420 m of the Project Location (300 m plus the 120 m Zone of Investigation) were searched for the presence of large stick nests to assess the presence of colonially-nesting bird species within suitable ELC communities. • Known locations at the Nut Island Duck Club Marsh and the Long Point Marsh.
Colonial-Nesting Bird Breeding Habitat (Ground)	• Any rocky island or peninsula within a lake or large river, close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM), Thicket (CUT), Savannah (CUS). • Nesting colonies of gulls and terns on islands or peninsulas associated with open water or in marshy areas • Brewers Blackbird colonies are found loosely on the ground or in low bushes in close proximity to streams and irrigation ditches within farmlands. • The edge of the colony and a minimum 150 m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0 ha with a colony is the SWH.	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support colonial bird breeding habitat. • The presence of appropriate habitat for colonially-nesting bird species within suitable ELC communities was assessed.

Table 3.1: Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
Migratory Butterfly Stopover Areas	• A combination of ELC communities, one from each land class is required: Field (CUM, CUT, CUS) and Forest (FOC, FOM, FOD, CUP) • Minimum of 10 ha in size with a combination of field and forest habitat present • Located within 5 km of Lake Ontario • Habitat should not be disturbed, and it should contain an abundance of preferred nectar plants and woodland edge for shelter	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support migratory butterfly stopover areas. • The presence of suitable ELC communities was assessed for migratory butterfly stopover areas.
Landbird Migratory Stopover Areas	• The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD) • Woodlots must be >10 ha in size and within 5 km of Lake Ontario – woodlands within 2 km of Lake Ontario are more significant	• Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support landbird migratory stopover areas. • The presence of suitable ELC communities was assessed for migratory landbird stopover areas.

3.1.7.2 Rare Vegetation Communities or Specialized Habitats

Rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. Some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size. Specialized habitat for wildlife is a community or diversity-based category, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife.

Rare Vegetation Communities and Candidate Specialized Wildlife Habitat have been identified by using the habitat criteria found in the SWHTG (MNR 2000) and Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012). The habitat criteria for each potential rare vegetation community and candidate specialized wildlife habitat, and methods employed to identify them in and within 120 m of the Project Location, has been summarized in **Table 3.2**.

Table 3.2: Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
Cliffs and Talus Slopes	• A Cliff is vertical to near vertical bedrock >3 m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris • Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT • Most cliff and talus slopes occur along the Niagara Escarpment	• As discussed in Section 2.2.4.2 of the Records Review, there are no known rare vegetation communities apart from old growth forests within 120 m of the Project Location. • ELC and preliminary botanical inventories conducted by Stantec in 2011 were used to assess the presence of rare vegetation communities.
Sand Barrens	• Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. • They have little or no soil and the underlying rock protrudes through the surface. • Usually located within other types of natural habitat such as forest or savannah. • Vegetation can vary from patchy and barren to tree covered but less than 60%. • Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite). • Tree cover always < 60%. • No minimum size for sand barren area. • Sand Barrens support rare species such as provincially Endangered Forked Three-awned Grass and American Badger. By extension, sand barren sites that could support these rare species (close proximity to other populations), historically or currently should be considered for higher priority conservation.	• As discussed in Section 2.2.4.2 of the Records Review, there are no known rare vegetation communities apart from old growth forests within 120 m of the Project Location. • ELC and preliminary botanical inventories conducted by Stantec in 2011 were used to assess the presence of rare vegetation communities.
Alvars	• An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. • The hydrology of alvars is complex, with alternating periods of inundation and drought. • Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator	• As discussed in Section 2.2.4.2 of the Records Review, there are no known rare vegetation communities apart from old growth forests within 120 m of the Project Location. • ELC and botanical inventories conducted by Stantec in 2011 were used to assess the presence of rare vegetation communities.

Table 3.2: Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	plant. • Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. • Vegetation cover varies from patchy to barren with a less than 60% tree cover. • Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland) • An Alvar site > 0.5 ha in size • Alvar is particularly rare in Ecoregion 6E where the only known sites are found in the western islands of Lake Erie	
Old-growth Forest	• Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species. • No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest)	• ELC and preliminary botanical inventories conducted in 2011 were used to further assess the presence of old growth forests. • Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.
Savannahs	• A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. • Tallgrass Prairie (TGP) and savannah were historically common in the near-shore areas of the Great Lakes. • In Ecoregion 6E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). • Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah	• As discussed in Section 2.2.4.2 of the Records Review, there are no known rare vegetation communities apart from old growth forests within 120 m of the Project Location. • ELC and preliminary botanical inventories conducted by Stantec in 2011 were used to assess the presence of rare vegetation communities.

Table 3.2: Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite). • No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH	
Tall-grass Prairies	• A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. • Tallgrass Prairie (TGP) and savannah were historically common in the near-shore areas of the Great Lakes • In Ecoregion 6E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). • Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite). • No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH	• As discussed in Section 2.2.4.2 of the Records Review, there are no known rare vegetation communities apart from old growth forests within 120 m of the Project Location. • ELC and preliminary botanical inventories conducted by Stantec in 2011 were used to assess the presence of rare vegetation communities.
Other Rare Vegetation Communities	• Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. • Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG • Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH. • ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M • The OMNR/NHIC will have up to date listing for rare vegetation communities.	• As discussed in Section 2.2.4.2 of the Records Review, there are no known rare vegetation communities apart from old growth forests within 120 m of the Project Location. • ELC and preliminary botanical inventories conducted by Stantec in 2011 were used to assess the presence of rare vegetation communities.
Waterfowl Nesting Area	• All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: • MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4,	• The results of ELC surveys and GIS analysis of the landscape were used to identify upland areas of open habitat >120 m wide that occurred adjacent to a large marsh, pond, swamp or swamp

Table 3.2: Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	• MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 • Note: includes adjacency to Provincially Significant Wetlands	thicket communities or clusters of these vegetation communities within 120 m of the Project Location. • Habitats adjacent to wetlands without standing water were not considered candidate SWH.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). • ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Searches for stick nests (active or not) as well as a general habitat assessment were conducted during wildlife habitat assessment surveys in the fall of 2011 and spring of 2012.
Woodland Raptor Nesting Habitat	• All natural or conifer plantation woodland/forest stands combined >30 ha or with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. • May be found in all forested ELC Ecosites. • May also be found in SWC, SWM, SWD and CUP3	• Searches for stick nests (active or not) as well as a general habitat assessment were conducted during wildlife habitat assessment surveys in the fall of 2011 and spring of 2012.
Turtle Nesting Areas	• Exposed mineral soil (sand or gravel) areas adjacent (<100 m) cxlviii or within the following ELC Ecosites: MAM1 • MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1 • Best nesting habitat for turtles is close to water, away from roads and sites	• As lands within the Study Area consisted primarily of cultivated agricultural cropland, the search for turtle nesting habitat focused on watercourses and any marshy wetlands within 120 m of the Project Location.

Table 3.2: Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	
Seeps and Springs	• Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs. • Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species	• As the Study Area consisted primarily of cultivated agricultural cropland, the search for seeps or springs focused on the natural features within 120 m of the Project Location.
Amphibian Breeding Habitat (Woodland)	• All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD • Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians • Presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat	• Natural vegetation communities with the potential to support amphibian breeding habitat (woodland) were assessed by Stantec during vegetation assessment surveys. Each feature was visited, and areas of standing water or areas which showed evidence of holding water through the spring (based on topography and vegetation) were identified. Size of pools, presence and depth of standing water, surrounding vegetation community, emergent and submergent vegetation and canopy cover were recorded.
Amphibian Breeding Habitat (Wetland)	• ELC Community Classes SW, MA, FE, BO, OA and SA. • Wetland areas >120 m from woodland habitats. • Wetlands and pools (including vernal	• Vegetation community classification surveys were used to identify habitat features within 120 m of the Project Location including those that may support bullfrogs (i.e., natural open

Table 3.2: Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	pools) >500 m^2 (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation.	aquatic and marsh habitats greater than 1 ha in size). • Each feature was visited, and areas of standing water or areas which showed evidence of holding water through the spring (based on topography and vegetation) were identified.

3.1.7.3 Species of Conservation Concern

Habitats in and within 120 m of the Project Location were assessed for their suitability to support historic species of conservation concern that are known to occur or have the potential to occur within the vicinity of the Study Area (**Table 8B, Appendix B**). Assessments were carried out for the following categories of species of conservation concern:

- Marsh breeding bird habitat;
- Breeding bird habitat (area-sensitive, open country, and shrub/early successional); and
- Special Concern and rare wildlife species.

Site investigations were carried out through a combination of vegetation surveys for plant species of conservation concern, and ELC-based habitat assessments for both plant and wildlife species of conservation concern as described in the Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012). Additional survey information for specific categories is discussed in **Table 3.3**.

Table 3.3: Characteristics Used to Identify Candidate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods
Marsh Bird Breeding Habitat	• Nesting occurs in wetlands. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently it may be found in upland shrubs or forest at a considerable distance from water. • All wetland habitats with shallow water and emergent aquatic vegetation. • May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.	• Site investigations were conducted to assess the potential for this habitat using ELC to delineate previously unidentified wetland communities within 120 m of the Project Location.
Woodland Area-sensitive Bird Breeding Habitat	• Habitats where interior forest is >4 ha (at least 200 m from the forest edge) breeding birds are breeding. • These include any of the following Community Types: Forest (FO), Treed Swamp (SW) that are mature (>60 years old) and >30 ha. • Condition of existing habitat at site • Size and location of habitat • Potential for long-term protection of the habitat • Representation of species/habitat within the municipality.	• Site investigations were conducted to assess the potential for woodlots within 120 m of the Project Location >30 ha in size with the potential to host populations of area-sensitive species, through the delineation and verification of forest communities by ELC.
Open Country Bird Breeding Habitat	• Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM). • Condition of existing habitat at site (level of disturbance) is an important consideration. For example, fields with intensive agriculture are not considered candidate habitat. Fields with light grazing are considered candidate habitat) • Size and location of habitat • Potential for long-term protection of the habitat • Representation of species/habitat within the municipality.	• Site investigations were conducted to assess the potential for grassland communities in and within 120 m of the Project Location to support area-sensitive bird species, through the delineation and verification of grassland communities by ELC. • Swallow migratory staging was also included in this type of habitat for Amherst Island because these species use this habitat for foraging during fall migration. More information is provided in Section 4.2.3. • The farming practice of hay field cutting before the end of the breeding cycle for grassland birds can reduce breeding success for these species up to 94% and hayfields are not considered to support viable populations of grassland breeding bird species (COSSARO 2010); however, due to the importance of Amherst Island for bird migration and grassland species such as the Short-eared Owl, all hayfields,

Table 3.3: Characteristics Used to Identify Candidate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods
		pastures, and cultural meadows have been identified as candidate significant wildlife habitat.
Shrub/Early Successional Bird Breeding Habitat	• Oldfield areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (CUT), Savannahs (CUS), or Woodlands (CUW). • Condition of existing habitat at site. • Size and location of habitat. • Potential for long-term protection of the habitat – should have a history of longevity, either abandoned fields or pasturelands. • Representation of species/habitat within the municipality.	• Site investigations were conducted to assess the potential for this habitat type using ELC to delineate thicket and savannah type communities.
S1-S3, Special Concern and SH Species and Communities	• All Species Concern or provincial rare plant and animal species element occurrences within a 1 or 10km grid.	• Site investigations were carried out through a combination of vegetation surveys for plant species of conservation concern, and ELC-based habitat assessments for both plant and wildlife species of conservation concern as described in the Draft SWH Ecoregion 6E Criterion Schedule. • **Table 3B, Appendix B** provides a description of each species of conservation concern and their associated habitat.

3.1.7.4 Animal Movement Corridors

Habitats within 120 m of the Project Location were assessed for their suitability to support animal movement corridors that are known to occur or have the potential to occur within the vicinity of the Study Area. Assessments were carried out for amphibian movement corridors.

Amphibian movement corridors have been identified by using the habitat criteria found in the SWHTG (MNR 2000) and Draft Significant Wildlife Habitat: Ecoregion 6E Criteria Schedules (MNR 2012). Habitat criteria and methods employed to identify them in and within 120 m of the Project Location, have been summarized in **Table 3.4**.

Table 3.4: Characteristics Used to Identify Candidate Habitat for Animal Movement Corridors

Candidate Animal Movement Corridor	Criteria	Methods
Amphibian Movement Corridor	• Corridors may be found in all ecosites associated with water • Determined based on identifying significant amphibian breeding habitat (wetland).	• Identified after Amphibian Breeding Habitat - Wetland (see Section 3.1.7.2) is confirmed. • Site investigations will be conducted after this confirmation to identify potential movement corridors

3.2 RESULTS

The Project Location, and areas within 120 m of it, was comprised primarily of actively cultivated cropland and pasture. Natural vegetation consisted of deciduous forest, swamp, cultural woodland and hedgerows and is described in **Section 3.2.1**.

Field notes for the site investigations are provided in **Appendix C.**

A summary of the corrections to the features identified through the Records Review, including new features or functions identified as a result of site investigations, is provided in **Table 5B, Appendix B** and discussed in the following sections. A summary of all natural features within 120 m of the Project Location is provided in **Tables 6B and 7B (Appendix B)**.

3.2.1 Vegetation Community and Vascular Plants Assessment

Site investigations identified discrete naturally-vegetated features in or within 120 m of the Project Location. Each feature was delineated and assigned a unique identification number (**Figures 2.1-2.5, Appendix A**), an appropriate ELC vegetation community code (as per Lee et al. 1998) and is summarized in **Tables 6B and 7B (Appendix B)**, which serves as a point of reference. This table describes the type, attributes, composition, function, and significance (if known) of each natural feature. Delineated ELC communities are shown on **Figures 2.1-2.5, Appendix A**. A memo describing the ELC communities in included with the field notes in **Appendix C**.

3.2.2 Wetlands

Wetlands within the Study Area are typically swamp maple or green ash mineral swamps with scattered meadow marshes and swamp thickets. A total of 22 wetlands were identified through the Records Review and field investigations as occurring in and within 120 m of the Project Location. Descriptions of these features can be found in **Table 6B, Appendix B** and boundaries shown on **Figures 2.1-2.5, Appendix A.**

3.2.2.1 Provincially Significant Wetlands

A total of two PSWs were identified within 120 m of the Project Location through the records review. No PSWs have been identified in the Project Location. Based on the results of the ELC and OWES investigations of Nut Island Duck Club Marsh and Long Point Marsh, the boundaries are recommended to be increased to include adjacent wetland communities. The revised PSW boundaries are shown on **Figures 2.4 and 2.5, Appendix A** and the corrections to the Records Review are described in **Table 5B, Appendix B.**

3.2.2.2 Unevaluated Wetlands

Nineteen additional wetlands, not previously identified by MNR, were identified within 120 m of the Project Location. These wetlands consisted primarily of Swamp Maple and Green Ash deciduous swamps with scattered Reed Canary Grass meadow marshes.

Potential wetland communities that were beyond 120 m of the Project Location and were not contiguous with identified features, as determined through air photo interpretation, were not included as part of the feature.

Corrections made to the Records Review for wetlands as a result of the site investigations are summarized in **Table 5B** (**Appendix B**). **Table 6B (Appendix B)** lists all wetlands identified and describes their attributes, composition, and function. An Evaluation of Significance is required for unevaluated wetlands and wetlands identified through field verification.

The Project Location is located in Wetland Features 6 and 7 and within 120 m of the remaining 18 wetlands.

3.2.3 Woodlands

Thirty-six woodlands were identified within 120 m of the Project Location during the Site Investigation. These woodlands are associated with Features 1 through 36, shown on **Figures 2.1-2.5, Appendix A**. Corrections made to the Records Review for the number of identified woodlands as a result of site investigations are summarized in **Table 5B (Appendix B)**. **Table 7B (Appendix B)** lists all woodlands identified and describes their attributes, composition, and function. An Evaluation of Significance is required for these woodlands.

The Project Location is located in Woodlands 4, 9, and 36, and within 120 m of the other 33 woodlands.

Potential woodland communities that were beyond 120 m of the Project Location and were not contiguous with identified features, as determined through air photo interpretation, were not included as part of the feature mapping.

3.2.4 Valleylands

Valleylands are natural areas south and east of the Canadian Shield that have flowing or standing water for some period of the year. They are linear systems stretching across the landscape from headwater areas into other aquatic features such as lakes and wetlands.

Site investigations confirmed that the Project Location predominately consists of gently rolling topography with no linear systems that meet the definition of a valleyland.

No valleylands were identified during field investigations. No corrections are required to the Records Review (**Table 5B, Appendix B**). No Evaluation of Significance is required.

3.2.5 ANSIs

The boundaries and characteristics of the Amherst Bay Life Science ANSI as described by the OMNR were confirmed during ELC surveys completed by Stantec biologists. No changes are proposed to the boundaries of the Amherst Bay Life Science ANSI. No corrections are required to the Records Review (**Table 5B, Appendix B**). No Evaluation of Significance is required.

3.2.6 Wildlife and Wildlife Habitat

Results of the site investigations for wildlife habitat are summarized in the following sections. The results are considered within the context of criteria for significant wildlife habitat as outlined within the SWHTG (MNR 2000) and Draft Significant Wildlife Habitat Ecoregion 6E Criterion schedule (MNR 2012) in order to determine whether natural communities within 120 m of the Project Location support candidate or confirmed significant wildlife habitat. Features associated with candidate significant wildlife habitat are identified in the following sections, and illustrated in **Figures 3.1-3.5, Appendix A** and **Figures 4.1-4.5, Appendix A**. **Table 8B (Appendix B)** lists all candidate significant wildlife habitats identified and describes their attributes, composition, and function. Corrections to the Records Review are shown in **Table 3.9**.

3.2.6.1 Seasonal Concentration Areas of Animals

Site Investigations involved a thorough assessment of natural areas for seasonal concentration areas for wildlife habitat. Potential habitat for seasonal concentration areas was examined during the Site Investigation phase, and is discussed in **Table 3.5**. Seasonal concentration areas that did not have any candidate significant wildlife habitat will not be carried forward to the Evaluation of Significance phase.

Table 3.5: Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Waterfowl Stopover and Staging Area (Terrestrial)	Yes (WT3)	Yes (WT1, WT2, and WT4)	Areas of cultural meadows and agricultural pastures with flooding in the spring are present in and within 120 m of the Project Location.	Yes
Waterfowl Stopover and Staging Area (Aquatic)	Yes (WA1)	No	Waterfowl stopover and staging habitat was identified in the IBA report between the island and the mainland. Shallow marsh habitat is found within 120 m of the Project Location in Long Point Marsh. The Project Location is not in these features.	Yes
Shorebird Migratory Stopover Area	Yes (SM1)	No	The shoreline of Lake Ontario is present within 120 m of the Project Location. Much of the Amherst Island shoreline is naturalized, with the exception of portions of the shoreline through the village or adjacent to residences. The shoreline predominate consists of rocky shelf, with sandy beach habitat along the western end of the island. The Amherst Bar on the east end of the island, which forms part of this candidate habitat feature, is a known shorebird stopover area.. The Project Location is not in the candidate shorebird migratory stopover area, but is located within 120 m.	Yes
Raptor Wintering Area	Yes (RWA9)	Yes (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7, RWA8, RWA10)	There are pastures, hayfields, and meadows >15 ha located adjacent to >5 ha of forest found in the Project Location.	Yes
Bat Hibernacula	No	No	There are no caves, abandoned mine shafts, underground foundations, and karst features or crevice/cave communities within 1120 m of the Project Location.	No
Bat Maternity Colonies	No	No	No snags or trees capable of supporting bat maternity roosts were found in numbers greater than 10 per hectare within 120 m of the Project Location.	No
Turtle Wintering Areas	Yes (TO1)	No	The Long Point Marsh is a large coastal marsh which could provide habitat for overwintering Midland Painted Turtles or Snapping Turtles. Lake Ontario provides habitat for Northern Map Turtles. These habitats are located within 120 m of the Project Location. The Project Location is not in this feature. Snapping Turtle and Northern Map Turtle (species of conservation concern) are considered under this habitat type.	Yes

Table 3.5: Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Snake Hibernacula	Yes (SN1)	No	Snake hibernacula features such as buried concrete or rock (e.g. building foundations, culverts, rock crevices or abandoned animal burrows) were found within 120 m of the Project Location. One feature was found; however, this feature was found in the vicinity of Front Road in the east end of Amherst Island, within 120 m of underground cabling only. This type of Project component would not have an operational impact on this type of habitat. It will therefore be treated as generalized significant wildlife habitat. The Project Location is not in this feature.	Yes; treated as significant
Colonial-Nesting Bird Breeding Habitat (bank/cliff)	No	No	Results of the vegetation community surveys determined that there are no eroding banks, sandy hills, borrow pits, steep slopes and sand piles present within 120 m of the Project Location. Although colonial-nesting species (e.g. cliff swallow) were recorded breeding within 120 m of the Project Location, they were using anthropogenic structures (e.g. barns) as nesting structures, which do not constitute candidate significant wildlife habitat.	No
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	No	No	There is a known Black-crowned Night Heron colony located in the Nut Island Duck Club Marsh and a Great Blue Heron colony in the Long Point Marsh. These colonies were found o be greater than 120 m plus a 300 m radius from the Project Location. No additional colonial-nesting bird breeding habitat features were found during the site investigation. Black-crowned Night Heron (a species of conservation concern) is considered under this habitat type.	No
Colonial-Nesting Bird Breeding Habitat (ground)	No	No	There is a known nesting site/colony used by Herring Gulls, Common Terns, and Cormorants located on the Brother Islands. No rocky islands or peninsulas are located within 120 m of the Project Location, and the Brother Islands would be the most significant in the region, which are located over 2km from the Project Location. Greater Black-backed Gull and Caspian Tern (species of conservation concern) are considered under this habitat type.	No
Migratory Butterfly Stopover Areas	Yes (MB2, MB3)	No	There are undisturbed fields with mixed habitat (forest, thicket, plantation, and/or edge)	Yes

Table 3.5: Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
			located along the shoreline of Lake Ontario within 120 m of the Project Location. The Project Location is not in these features. Monarch butterflies (a species of conservation concern) are considered under this habitat type.	
Landbird Migratory Stopover Areas	Yes (ML1, ML2, ML3, ML4, ML5)	No	There are woodlands >10 ha located within 2 km of Lake Ontario with a variety of habitats. These are also located within 120 m of the Project Location. The Project Location is not in these features.	Yes

3.2.6.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

Site Investigation results pertaining to rare vegetation communities and specialized habitats in and within 120 m of the Project Location are summarized in **Table 3.6**. Rare vegetation community types or specialized habitats for wildlife that did not have any candidate significant wildlife habitat will not be carried forward to the Evaluation of Significance phase.

Table 3.6: Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Cliffs and Talus Slopes	No	No	Rare vegetation communities (cliffs and talus slopes) were not observed during ELC and vegetation surveys in and within 120 m of the Project Location.	No
Sand Barrens	No	No	Rare vegetation communities (sand barrens) were not observed during ELC and vegetation surveys in and within 120 m of the Project Location.	No
Alvars	No	No	Rare vegetation communities (alvars) were not observed during ELC and vegetation surveys in and within 120 m of the Project Location.	No
Old-growth Forest	Yes (OGF1, OGF2, OGF3)	No	Old-growth forests identified by the CRCA are present within 120 m of the Project Location. The Project Location is not in these features. ELC surveys and woodland assessments of all other woodlands within 120 m of the Project Location	Yes

Table 3.6: Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
			did not have suitable characteristics of old-growth forests. All mature woodlands within 120 m of the Project Location contained historical forestry management.	
Savannahs	No	No	Rare vegetation communities (savannahs) were not observed during ELC and vegetation surveys in and within 120 m of the Project Location.	No
Tall-grass Prairies	No	No	Rare vegetation communities (tall-grass prairie) were not observed during ELC and vegetation surveys in and within 120 m of the Project Location.	No
Other Rare Vegetation Communities	No	No	Other rare vegetation communities were not observed during ELC and vegetation surveys in and within 120 m of the Project Location.	No
Waterfowl Nesting Area	Yes (WN1)	Yes (WN2)	Long Point Marsh represents a large open aquatic habitat in proximity to the Project Location. Upland habitats adjacent to the Long Point Marsh provide candidate habitat for nesting waterfowl. The Project Location is not in these features. Other wetlands adjacent to the Project Location do not provide the standing water that would support breeding waterfowl.	Yes
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	Yes (BE1, BE2)	No	Two priority areas for Bald Eagle nesting conservation were identified in the report *Conserving Lake Ontario and Upper St. Lawrence Bald Eagle* Habitats (St. Lawrence Bald Eagle Working Group 2008). The Project Location is not in these features. ELC and habitat assessments of all woodlands and vegetated watercourses within 120 m of the Project Location did not detect any potential nests of Osprey and Bald Eagle. Osprey are nesting on a constructed platform 50 m south of the ferry dock; however, constructed platforms are not considered significant wildlife	No

Table 3.6: Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
			habitat. Because no active nests were found for either of these species, no candidate significant wildlife habitat is present in or within 120 m of the Project Location for Bald Eagle or Osprey.	
Woodland Raptor Nesting Habitat	Yes (WR1, WR2)	No	Two candidate habitats for woodland raptor nesting are available in woodlands that are >30 ha in size, composed of swamp (SW) and forest (FO). These are associated with Woodlands 4 and 21. The Project Location is not in these features.	Yes
Turtle Nesting Areas	No	No	ELC and habitat assessment surveys undertaken in all woodlands and watercourses within 120 m of the Project Location did not locate any exposed mineral soil (sand or gravel) or contain suitable habitat to support turtle nesting habitat. No candidate significant wildlife habitat was present in or within 120 m of the Project Location for turtle nesting habitat. Snapping Turtle and Northern Map Turtle (species of conservation concern) are considered under this habitat type.	No
Seeps and Springs	No	No	ELC and woodland habitat assessment surveys of all woodlands within 120 m of the Project Location did not identify seeps or springs.	No
Amphibian Breeding Habitat (Woodland)	Yes (ABWO1, ABWO2, ABWO3)	No	Candidate amphibian breeding habitat is present within 120 m of the Project Location and within 120 m of woodlands. The Project Location is not in these features. Western Chorus Frog (a species of conservation concern) is considered under this habitat type.	Yes
Amphibian Breeding Habitat (Wetland)	Yes (ABWE1, ABWE2)	No	Candidate amphibian breeding habitat is present within 120 m of the Project Location which is >500 m^2 and not located within 120 m of woodlands.	Yes

Table 3.6: Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
			The Project Location is not in these features. Western Chorus Frog (a species of conservation concern) is considered under this habitat type.	

3.2.6.3 Species of Conservation Concern

Site Investigation results pertaining to habitats for species of conservation concern in and within 120 m of the Project Location are summarized in **Table 3.7**. Species of conservation concern that did not have any candidate significant wildlife habitat will not be carried forward to the Evaluation of Significance phase.

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
Marsh Bird Breeding Habitat	Yes (MBB1)	No	Marsh habitats identified in the Site Investigation are all along small agricultural drains and do not provide adequate nesting habitat for marsh breeding birds. The Long Point Marsh provides the best habitat for marsh breeding birds in the region. The Project Location is not in this feature. Black Tern and Black-crowned Night Heron (species of conservation concern) are considered under this habitat.	Yes
Woodland Area-sensitive Bird Breeding Habitat	Yes (ABB1, ABB2)	No	Two candidate habitats for woodland area-sensitive bird breeding are available in woodlands that are >30 ha in size with >4 ha of interior habitat, composed of swamp (SW) and forest (FO). These are associated with Woodlands 4 and 21. The Project Location is not in these features. Red-headed Woodpecker and Canada Warbler (species of	Yes

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
			conservation concern) are considered under this habitat type.	
Open Country Bird Breeding Habitat	Yes	Yes (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB9)	Site investigations confirmed that open country habitat exceeding 30 ha was present within 120 m of the Project Location. Swallow migratory staging was also included under this habitat, which provides the ecological functions required for swallow foraging. Red-headed Woodpecker and Common Nighthawk (species of conservation concern) are considered under this habitat type.	Yes
Shrub/Early Successional Bird Breeding Habitat	Yes (SSB1, SSB2, SSB3, SSB4, SSB5)	No	Site investigations confirmed that thicket or woodland habitat exceeding 10 ha was present within 120 m of the Project Location. The Project Location is not in these features. Red-headed Woodpecker, Common Nighthawk, Golden-winged Warbler, and Yellow-breasted Chat (species of conservation concern) are considered under this habitat type.	Yes
Special Concern and Rare Wildlife Species (3 species of plants, 1 species of Lepidoptera, 1 species of amphibian, 3 species of reptiles, 3 species of mammal, and 14 species of birds as per **Table 3B, Appendix B**				
Monarch	Yes	No	This species prefers abandoned farmland and roadsides, but also in city gardens and parks. The host plant is milkweed. The Project Location is not in these features. Habitat for this species has been determined through the consideration of Migratory Butterfly Stopover Areas.	Yes; considered through Migratory Butterfly Stopover Areas
Western Chorus Frog	Yes	No	This species prefers roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland	Yes; considered through Amphibian Breeding Habitat

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
			or open country with cover and moisture; small ponds and temporary pools. The Project Location is not in these features. Habitat for this species has been determined through the consideration of Amphibian Breeding Habitat (Woodland and Wetland).	(Woodland and Wetland)
Eastern Milksnake	Yes	No	This species prefers farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites (MNR 2000). Habitat for this species has been determined through the consideration of Snake Hibernacula (Section 3.2.6.1). The Project Location is not in these features. Due to the generalist nature of this species, special mitigation measures will be provided in the Environmental Impact Study report (Section 5.5.5).	Yes; considered through Snake Hibernacula
Northern Map Turtle	Yes	No	This species prefers large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites (MNR 2000). Habitat for this species has been determined through the consideration of Turtle Overwintering Habitat (Section 3.2.6.1). The Project Location is not in this feature.	Yes; considered through Turtle Overwintering Habitat and Nesting Habitat
Snapping Turtle	Yes	No	This species prefers permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms (MNR 2000). Habitat for this species has been determined through the consideration of Turtle	Yes; considered through Turtle Overwintering Habitat and Nesting Habitat

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
			Overwintering Habitat (Section 3.2.6.1). The Project Location is not in this feature.	
Black Tern	Yes	No	This species prefers wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1 m deep) water and areas of open water near nests; requires marshes >20 ha in size (MNR 2000). Habitat for this species has been determined through the consideration of Marsh Breeding Bird Habitat. The Project Location is not in these features.	Yes; considered under Marsh Breeding Bird Habitat
Redhead	Yes	No	This species prefers shallow cattail/bulrush marshes, lakes and ponds and fens; preferred nesting usually close to shallow water (MNR 2000). Habitat for this species has been determined through the consideration of Waterfowl Nesting Areas. The Project Location is not in these features.	Yes; considered under Waterfowl Nesting Areas
Black-crowned Night Heron	Yes	No	This species prefers deciduous woodland swamps, cattail marshes, islands, wooded river and lake banks, coastal wetlands (MNR 2000). Habitat for this species has been determined through the consideration of Colonial-Nesting Bird Breeding Habitat (tree/shrub). The Project Location is not in these features.	No; considered under Colonial-Nesting Bird Breeding Habitat (tree/shrub)
Greater Black-backed Gull	No	No	This species prefers flat rocky coastal islands, moorlands, rocky beaches, cliffs; nest is solitary or in small (rarely large) colonies (MNR 2000). There is no habitat for this species in or within 120 m of the Project Location.	No

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
Caspian Tern	No	No	This species prefers open habitat near large lakes or rivers, beaches, shorelines, rocky or sandy beaches, offshore islands (MNR 2000). There is no habitat for this species in or within 120 m of the Project Location.	No
Short-eared Owl	Yes	Yes (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB9)	This species prefers grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat (MNR 2000). The Short-eared Owl breeding territories have been studied extensively on Amherst Island by Kristen Keyes of McGill University (Keyes 2011). The locations of known breeding territories in 2009, 2010, and observations by Stantec in 2011 were used in the consideration of this habitat. Four of these areas are located within 120 m of the Project Location. Although habitat for this species has been determined through the consideration of Open Country Breeding Bird Habitat and Raptor Wintering Areas, it is also considered as a separate habitat due to the relative abundance of this species on Amherst Island.	Yes
Red-headed Woodpecker	Yes	Yes	This species prefers open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory	Yes; is considered through Woodland Area-Sensitive Bird Breeding, Open Country Bird Breeding, and Shrub/Early Successional Bird Breeding Habitat

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
			(MNR 2000). This wide range of habitats is considered through Woodland Area-Sensitive Bird Breeding, Open Country Bird Breeding, and Shrub/Early Successional Bird Breeding Habitat.	
Common Nighthawk	Yes	Yes	This species prefers open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs. This also includes open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks (MNR 2000). This wide range of habitats is considered through Open Country Bird Breeding, Bird Marsh Breeding, and Shrub/Early Successional Bird Breeding Habitat.	Yes; considered through Open Country Bird Breeding, Bird Marsh Breeding, and Shrub/Early Successional Bird Breeding Habitat
Olive-sided Flycatcher	No	No	This species prefers semi-open, conifer forest, prefers spruce; near pond, lake or river; treed wetlands for nesting; burns with dead trees for perching (MNR 2000). Coniferous forest is very limited on Amherst Island and no coniferous forests near water are present in or within 120 m of the Project Location.	No
Golden-winged Warbler	Yes	No	This species prefers early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubbery clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha of habitat (MNR 2000). Habitat for this species has been determined through the	Yes; considered through Shrub/Early Successional Bird Breeding Habitat

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
			consideration of Shrub/Early Successional Bird Breeding Habitat. The Project Location is not in these features.	
Canada Warbler	Yes	No	This species prefers interior forest; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30 ha (MNR 2000). Habitat for this species has been determined through the consideration of Woodland Area-Sensitive Bird Breeding Habitat. The Project Location is not in these features.	Yes; considered through Woodland Area-Sensitive Bird Breeding Habitat
Yellow-breasted Chat	Yes	No	This species prefers thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc (MNR 2000). Habitat for this species has been determined through the consideration of Shrub/Early Successional Bird Breeding Habitat. The Project Location is not in these features.	Yes; considered through Shrub/Early Successional Bird Breeding Habitat
Louisiana Waterthrush	Yes	No	This species prefers wooded ravines with running streams, woodlands swamps, and large tracts of mature deciduous or mixed forests (MNR 2000). It has been observed on the mainland; however, there are no known records from Amherst Island. There are three large, mature deciduous swamps with drains running near or through them: Features 4, 21, and 15, which will be considered candidate significant Louisiana waterthrush habitat. The Project Location is not in these features.	Yes
Wilson's Phalarope	Yes (WP1)	No	This S3B species prefers open wetlands, ponds, lakes, marshes	Yes

Table 3.7: Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
			and sloughs with wet meadow vegetation; freshwater coastal marshes; nests on ground in loose colonies (MNR 2000). It is known to breed on the eastern shoreline, within the coastal marsh on the Kingston Field Naturalists property (Weir 2008). This property is considered candidate significant wildlife habitat. The Project Location is not in these features.	
Bats	No	No	Little Brown Bat, Eastern Pipistrelle, and Northern Long-eared Bat all have maternity sites in cavity trees and hibernate in caves, tunnels, or abandoned mine sites (MNR 2000). Habitat for these species has been determined through the consideration of Bat Hibernacula and Bat Maternity Colonies.	No
Plants	No	No	Three rare plant species were identified to potentially occur within the Study Area during the Records Review: Carolina Whitlow-grass, Stiff Gentian, and Smith's Bulrush. Through site investigations, potential habitat was identified for 2 of these plant species within 120 m of the Project Location, including: Stiff Gentian and Smith's Bulrush. However, complete ELC surveys were conducted and no rare plant species were observed, including any of the rare species known from the Study Area.	No

3.2.6.4 Animal Movement Corridors

Site Investigation results pertaining to animal movement corridors in and within 120 m of the Project Location are summarized in **Table 3.8**. Animal movement corridors that were not observed in the Study Area will not be carried forward to the Evaluation of Significance phase.

Table 3.8: Characteristics Used to Identify Candidate Habitat for Species of Conservation Concern

Candidate Animal Movement Corridor	Present in or within 120 m of Project Location	Present in Project Location	Rationale	Carried Forward to EOS (Y/N)
Amphibian Movement Corridor	No	No	The areas around ABWE1 and ABWE2 were examined for amphibian movement corridors, as these wetlands are candidate significant wildlife habitat for amphibian breeding habitat (wetland). Amphibian movement corridors should consist of native vegetation, no road crossings, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant (OMNR 2011a). Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat – Wetland, which has not yet been confirmed. Corridors should be at least 200 m wide with gaps <20 m and if following riparian area with at least 15 m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors; however amphibians must be able to get to and from their summer and breeding habitat (OMNR 2011a). As the two wetland habitats (ABWE1 and ABWE2) are bounded by roads with no corridor >200 m, the habitat within the Study Area does not meet the criteria identified as significant.	No

3.3 SITE INVESTIGATION RESULTS SUMMARY

Table 3.9 provides a summary of only those natural features that will be carried forward to the Evaluation of Significance.

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
Wetlands				
1	Wetland	UL-74 AR-94	No	Yes
2	Wetland	WT-41 UL-96 AR-52 TC-47	No	Yes
3	Wetland	UL-3 TC-104 BU-3	No	Yes
4	Wetland	WT-76 UL-41 AR-38TC-39	No	Yes
5	Wetland	WT-5	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
		UL-3 AR-11 TC-9		
6	Wetland	WT-overlapping UL-overlapping AR-overlapping TC-overlapping	No	Yes
7	Wetland	AR-overlapping	No	Yes
8	Wetland	UL-28 AR-103	No	Yes
9	Wetland	WT-68 UL-18 AR-99 TC-61	No	Yes
10 (PSW)	Wetland – Nut Island Duck Club Marsh	WT-3 UL-13 AR-74 TC-3	Yes	Significant (does not need EOS)
11	Wetland	WT-60 UL-115 AR-77 TC-62	No	Yes
12	Wetland	WT-10 UL-4 AR-7 TC-3	No	Yes
13	Wetland	UL-1 AR-100	No	Yes
14	Wetland	UL-40 AR-44	No	Yes
15	Wetland	UL-18	No	Yes
16	Wetland	UL-19 AR-10	No	Yes
17	Wetland	UL-3	No	Yes
18	Wetland	UL-62 AR-58	No	Yes
19	Wetland	WT-62 UL-102 AR-107 TC-46	No	Yes
20	Wetland	UL-24 AR-42	No	Yes
21 (PSW)	Wetland – Long Point Marsh	WT-119 AR-78	Yes	Significant (does not need EOS)

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
22	Wetland	TC - 29	No	Yes
Woodlands				
1	Woodland	WT – 47 UL – 4 AR – 7 TC - 3	No	Yes
2	Woodland	UL-100	No	Yes
3	Woodland	UL-20 AR-16	No	Yes
4	Woodland	WT-48 UL-overlapping AR-3 TC-23	No	Yes
5	Woodland	WT-110 UL-60 AR-50 TC-62	No	Yes
6	Woodland	UL-18	No	Yes
7	Woodland	UL-7 AR-8	No	Yes
8	Woodland	UL-40 AR-44	No	Yes
9	Woodland	UL-overlapping AR-overlapping	No	Yes
10	Woodland	WT-71 TC-83	No	Yes
11	Woodland	WT-68 UL-18 AR-99 TC-61	No	Yes
12	Woodland	WT-67 TC-70	No	Yes
13	Woodland	UL-3 AR-18	No	Yes
14	Woodland	UL-3 AR-103	No	Yes
15	Woodland	WT-71 TC-71	No	Yes
16	Woodland	WT-91 UL-45 AR-41 TC-111	No	Yes
17	Woodland	WT-70 UL-54	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
		AR-58 TC-67		
18	Woodland	UL-3	No	Yes
19	Woodland	UL-3 BU-45	No	Yes
20	Woodland	WT-67 UL-30 AR-34 TC-33	No	Yes
21	Woodland	WT-44 UL-3 AR-39 TC-40	No	Yes
23	Woodland	UL-28 AR-17 TC-81	No	Yes
24	Woodland	UL-3 AR-3	No	Yes
25	Woodland	WT-77 UL-3 AR-3 TC-81	No	Yes
26	Woodland	TC-111	No	Yes
28	Woodland	UL-3 TC – 92 BU - 107	No	Yes
29	Woodland	AR-92 TC-109	No	Yes
30	Woodland	UL-6 AR-9	No	Yes
32	Woodland	UL-18	No	Yes
33	Woodland	UL-87	No	Yes
35	Woodland	UL-72 AR-75 TC-104	No	Yes
36	Woodland	UL – 3 TC – overlapping BU – overlapping	No	Yes
ANSIs				
Wetland 21	Amherst Bay Life Science ANSI	WT-119 AR-78	Yes	Significant (does not need EOS)
Seasonal Concentration Areas				
WT1	Waterfowl Stopover and	WT – overlapping	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
	Staging Area (Terrestrial)	AR – overlapping UL – overlapping		
WT2	Waterfowl Stopover and Staging Area (Terrestrial)	AR – overlapping	No	Yes
WT3	Waterfowl Stopover and Staging Area (Terrestrial)	UL – 4	No	Yes
WT4	Waterfowl Stopover and Staging Area (Terrestrial)	UL – 3 AR – overlapping BU – overlapping	No	Yes
WA1	Waterfowl Stopover and Staging Area (Aquatic)	WT-119 AR-78	No	Yes
SM1	Shorebird Migratory Stopover Area	UL – overlapping AR – overlapping	No	Yes
RWA-1	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
RWA-2	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
RWA-3	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
RWA-4	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
RWA-5	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
RWA-6	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
RWA-7	Raptor Wintering Area	UL – 4 AR – 8	No	Yes
RWA-8	Raptor Wintering Area	UL – overlapping TC – 32 BU – 37	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
RWA-9	Raptor Wintering Area	UL – overlapping TC – overlapping BU – overlapping	No	Yes
RWA-10	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
TO1	Turtle Overwintering	WT – 115 AR – 77 TC – 118	No	Yes
ML1	Landbird Migratory Stopover Areas	WT – 48 UL – 3 AR – 3 TC – 23	No	Yes
ML2	Landbird Migratory Stopover Areas	WT – 71 TC – 83	No	Yes
ML3	Landbird Migratory Stopover Areas	WT – 71 TC – 71	No	Yes
ML4	Landbird Migratory Stopover Areas	WT – 44 UL – 3 AR – 39 TC – 40	No	Yes
ML5	Landbird Migratory Stopover Areas	UL – 28 AR – 17 TC – 81	No	Yes
MB2	Migratory Butterfly Stopover Area	WT – 51 UL – 9 AR – 3 TC – 29	No	Yes
MB3	Migratory Butterfly Stopover Area	UL – 4 TC – 32 BU - 37	No	Yes
Rare Vegetation Communities and Specialized Habitat for Wildlife				
OGF1	Old Growth Forest	UL – 8	Yes	Yes
OGF2	Old Growth Forest	WT – 48 UL – 103 AR – 98 TC – 50	Yes	Yes
OGF3	Old Growth Forest	WT – 71 TC – 83	Yes	Yes
WN1	Waterfowl Nesting Area	WT – 71 TC – 71	No	Yes
WN2	Waterfowl Nesting Area	AR – overlapping	No	Yes
WR1	Woodland Raptor Nesting	WT – 48	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
		UL – 3 AR – 3 TC – 23		
WR2	Woodland Raptor Nesting	WT – 44 UL – 3 AR – 39 TC – 40	No	Yes
ABWO1	Amphibian Breeding Habitat (Woodland)	UL – 19 AR – 11	No	Yes
ABWO2	Amphibian Breeding Habitat (Woodland)	UL - 59 AR – 54	No	Yes
ABWO3	Amphibian Breeding Habitat (Woodland)	TC - 29	No	Yes
ABWE1	Amphibian Breeding Habitat (Wetland)	WR – 114 AR – 77 TC – 118	No	Yes
ABWE2	Amphibian Breeding Habitat (Wetland)	UL - 3	No	Yes
Habitat for Species of Conservation Concern				
MBB1	Marsh Breeding Bird Habitat	WT-115 AR-78 TC - 119	No	Yes
ABB1	Woodland Area-Sensitive Breeding Bird Habitat	WT – 48 UL – 3 AR – 3 TC – 23	No	Yes
ABB2	Woodland Area-Sensitive Breeding Bird Habitat	WT – 44 UL – 3 AR – 39 TC – 40	No	Yes
OCB-1	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
OCB-2	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-3	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
OCB-4	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
		UL – overlapping TC – overlapping BU – overlapping		
OCB-5	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
OCB-6	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-7	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-8	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-9	Open Country Bird Breeding Habitat	UL – 4 AR – 8	No	Yes
SSB1	Shrub/Early Successional Bird Breeding Habitat	UL – 20 AR – 16	No	Yes
SSB2	Shrub/Early Successional Bird Breeding Habitat	WT – 110 UL -11 AR – 3 TC – 74	No	Yes
SSB3	Shrub/Early Successional Bird Breeding Habitat	UL – 94 AR – 90 TC – 98	No	Yes
SSB4	Shrub/Early Successional Bird Breeding Habitat	WT – 65 UL – 70 AR – 66 TC - 65	No	Yes
SSB5	Shrub/Early Successional Bird Breeding Habitat	WT – 35 UL – 90 AR – 101 TC – 34	No	Yes
LW1	Louisiana Waterthrush	WT – 48 UL – 3 AR – 3 TC – 23	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
LW2	Louisiana Waterthrush	WT – 71 TC – 71	No	Yes
LW3	Louisiana Waterthrush	WT – 44 UL – 3 AR – 39 TC – 40	No	Yes
OCB-1	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
OCB-2	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-3	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
OCB-4	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-5	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	No	Yes
OCB-6	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-7	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-8	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	No	Yes
OCB-9	Short-eared Owl	UL-4 AR-8	No	Yes

Table 3.9: Natural Features Carried Forward to Evaluation of Significance

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Identified in Records Review	Evaluation of Significance Required
WP1	Wilson's Phalarope	UL-13 AR-17	Yes	Yes
Generalized Significant Wildlife Habitats				
SN1	Snake Hibernacula	Not within 120 m of infrastructure identified in Appendix D of the NHA guide that will have an operational impact on the habitats. Therefore these habitats will be carried forward to the Environmental Impact Study where they will be treated as significant and general construction mitigation will be applied.	No	Significant - Generalized

Legend: WT: Wind Turbine; UL: Underground Transmission Line; AR: Access Road, OL: Overhead Transmission Line, TC: Temporary Construction Areas, BU: Building/Substation

Natural features identified in the Records Review were confirmed through the Site Investigation program. Corrections made to the Records Review are provided in **Table 5B, Appendix B**.

3.4 QUALIFICATIONS

Personnel responsible for conducting the site investigations are listed in **Table 4B, Appendix B**. Where available, staff summaries and qualifications are provided in **Appendix D**.

4.0 Evaluation of Significance

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

Natural features present in and within 120 m of the Project Location requiring an Evaluation of Significance are summarized in **Table 3.9**.

4.1 METHODS

Wetlands and Life Science ANSIs were determined to be provincially significant if they had been identified as such by MNR. This information was obtained from NHIC and through correspondence with the local MNR District. Non-provincially significant wetlands are those that have been evaluated but did not receive sufficient points to be considered provincially significant. Wetlands that have yet to be examined are termed unevaluated. These unevaluated wetlands and those additional wetlands identified during field investigations were assessed during site investigations and desktop analyses using evaluation criteria or procedures established and accepted by MNR.

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

Sources used in the Evaluation of Significance for the natural features within 120 m of the Project Location included:

- Ontario Wetland Evaluation System (MNR 2002);
- NHA Guide for Renewable Energy Projects (MNR 2011a);
- Significant Wildlife Habitat Technical Guide (MNR 2000); and
- Draft SWH Ecoregion 6E Criterion Schedule (MNR 2012).

Provincial designations for Special Concern species were obtained from the most recent Committee on the Status of Species at Risk in Ontario (COSSARO 2010) assessments. Federally, designations for Endangered, Threatened and Special Concern species were obtained from the most recent Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2010) assessments and the schedules of the *Species at Risk Act* (SARA) were used to determine species protection.

Within the context of O. Reg 359/09, Endangered and Threatened species are addressed as part of MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects*

(APRD) requirements and are therefore not included as part of this NHA. Information required with regards to endangered and threatened species is being submitted to MNR under separate cover as part of the Amherst Island Wind Energy Project APRD Report. Where this information indicates that approvals or permits are required, these will be addressed separately through the applicable statute and its permitting process.

These features are shown on **Figures 2.1-2.5, Appendix A**. Specific methods used in the Evaluation of Significance for each type of natural feature are detailed in the following sections.

4.1.1 Wetlands

For the purposes of this evaluation, wetlands previously identified and confirmed by MNR as provincially significant or locally significant are considered to meet the requirements for a determination of significance. Unless field investigations provided evidence to contradict the existing MNR assessment of significance, the designation as assigned by MNR is used. Wetland boundaries as delineated by MNR were confirmed during site investigations by an Ontario Wetland Evaluation System (OWES) trained evaluator. Boundaries as delineated during field investigations were considered accurate for the purposes of this report; however, additional wetland ELC polygons surrounding the two PSWs (Nut Island Duck Club Marsh and Long Point Marsh) were identified, which were included in the final boundaries for these two wetlands (**Table 5B, Appendix A**).

During site investigations additional wetland communities were identified within 120 m of the Project Location. Data were collected through desktop procedures (e.g. aerial photograph interpretation) to supplement on-site field investigations. The Wetland Characteristics and Ecological Functions Assessment (WCEFA) for Renewable Energy Projects approach provided in Appendix C of the NHA Guide for Renewable Energy Projects (MNR 2011a) was used to assess previously-unevaluated wetlands identified in LIO (LIO 2012) and to assess additional wetlands identified during field investigations. Although this procedure does not evaluate the significance of these wetlands with the same level of rigour as the OWES, it provides a procedure by which the significance of these wetlands can be assumed and their functions assessed based on the criteria established within the OWES manual.

As described in **Section 3.2.2.2**, 20 unevaluated wetlands were identified within 120 m of the Project Location, and required an Evaluation of Significance. For the two wetlands located in the Project Location (Wetlands 6 and 7), an OWES evaluation was completed.

4.1.2 Woodlands

Guidance provided in Section 6.2.2 of the NHA Guide for Renewable Energy Projects (MNR 2011a) was used to evaluate woodlands. The local planning authority has a responsibility for designating significant woodlands, using criteria that are provided in the NHA Guide. The Study Area falls within the Township of Loyalist within the County of Lennox and Addington. For woodlands on Amherst Island, the CRCA study utilized a 4 ha minimum threshold when

determining significance based on size. This 4 ha threshold was determined based on the 5–15% total percent woodland cover on Amherst Island alone as opposed to the total woodland cover within Loyalist Township. As described in **Section 3.2.3**, 32 woodlands were located within 120 m of the Project Location, and required an Evaluation of Significance.

4.1.3 Wildlife and Wildlife Habitat

Although specific site visits are assigned to target particular groups (i.e. amphibians, reptiles, birds), all visits were conducted by qualified ecologists. All observations made over the duration of the field program are compiled within the list of wildlife for the Study Area (**Appendix F**) and are considered in the assessment of wildlife use of the site.

Given a review of available background information and an analysis of candidate significant wildlife habitat components that occurred in or within 120 m of the Project Location, a four-season pre-construction field survey program was conducted.

Collectively, these multiple surveys, the habitats they cover, and the period over which they occur (season and time of day) offer a comprehensive set of field observations for fauna species on site.

The field survey program to assess wildlife use of the Study Area included (see **Table 4B, Appendix A** for a summary):

- 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); and
- 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).

The following candidate significant wildlife habitats were identified as occurring in and within 120 m of the Project Location, requiring an Evaluation of Significance.

1. Seasonal Concentration Areas

    - Waterfowl stopover and staging areas (terrestrial): candidate features WT1, WT2, WT3, and WT4
    - Waterfowl stopover and staging areas (aquatic): candidate feature WA1
    - Shorebird migratory stopover area: candidate feature SM1
    - Raptor wintering areas: candidate features RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7, RWA8, RWA9, and RWA10
    - Turtle overwintering area (TO1)
    - Landbird migratory stopover areas: candidate features ML1, ML2, ML3, ML4 and ML5
    - Migratory butterfly stopover areas: candidate features MB2 and MB3

2. Rare Vegetation Types or Specialized Habitats

    - Old growth forest: candidate features OGF1, OGF2 and OGF3
    - Waterfowl nesting area: candidate features WN1 and WN2
    - Woodland raptor nesting areas: candidate features WR1 and WR2
    - Amphibian breeding habitat (woodland): candidate features ABWO1, ABWO2 and ABWO3
    - Amphibian breeding habitat (wetland): candidate features ABWE1 and ABWE2

3. Species of Conservation Concern

    - Marsh breeding bird habitat: candidate feature MBB1
    - Woodland area-sensitive breeding bird habitat: candidate features ABB1 and ABB2
    - Open country breeding bird habitat, including staging swallow habitat: candidate features OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8 and OCB9
    - Shrub and early successional breeding bird habitat: candidate features SSB1, SSB2, SSB3, SSB4 and SSB5
    - Species of Conservation Concern habitats:
        - Louisiana Waterthrush: candidate features LW1, LW2 and LW3
        - Short-eared Owl: candidate features OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8 and OCB9

- Wilson's Phalarope: candidate feature WP1
- Snake hibernacula (SN1) – note: this habitat will be treated as significant

A summary of the methods and the criteria used to evaluate the significance of each component of candidate significant wildlife habitat are provided below. The approved workplan submitted to the MNR in 2011 is included in **Appendix G**. Full detailed methods are also provided in **Appendix G**.

4.1.3.1 Seasonal Concentration Areas of Animals

The criteria and methods used to evaluate the significance of candidate significant wildlife seasonal concentration areas in and within 120 m of the Project Location are presented in **Table 4.1.**

Table 4.1: Criteria and Methods Used to Evaluate Seasonal Concentration Areas of Animals

Candidate Seasonal Concentration Area	Criteria	Methods	Seasonal Timing
Waterfowl Stopover and Staging Areas (Terrestrial)	• Presence of annual concentration of listed species (American Black Duck, Wood Duck, Green-winged Teal, Blue-winged Teal, Mallard, Northern Pintail, Northern Shoveler, American Widgeon, Gadwall) • Mixed species aggregations of 100 or more individuals • Annual use of habitat	• Studies were completed during the spring migratory season. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for stopover driving transects and point counts • Stopover counts were conducted by driving a set transect, stopping at candidate habitats and conducting waterfowl counts to estimate numbers and species • Counts timed to coincide with peak numbers (dates and times)	• March-May
Waterfowl Stopover and Staging Areas (Aquatic)	• Presence of annual staging of listed species (Canada Goose, Cackling Goose, Snow Goose, American Black Duck, Northern Pintail, Northern Shoveler, American Widgeon, Gadwall, Green-winged Teal, Blue-winged Teal, Hooded Merganser, Common Merganser, Lesser Scaup, Greater Scaup, Long-tailed Duck, Surf Scoter, White-winged Scoter, Black Scoter, Ring-necked Duck, Common Goldeneye, Bufflehead, Redhead, Ruddy Duck, Red-	• Studies were completed during the spring migratory season. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" for stopover driving transects and point counts • Stopover counts conducted by driving a set transect, stopping at candidate habitats and conducting waterfowl counts to estimate numbers and species • Counts timed to coincide with	• March-May

Table 4.1: Criteria and Methods Used to Evaluate Seasonal Concentration Areas of Animals

Candidate Seasonal Concentration Area	Criteria	Methods	Seasonal Timing
	breasted Merganser, Brant, Canvasback) • Mixed species aggregations of 100 or more individuals for 7 days • Areas with annual staging of Ruddy Ducks, Canvasbacks, and Redheads are significant wildlife habitat • Annual use of habitat	peak numbers (dates and times)	
Shorebird Migratory Stopover Area	• Presence of 3 or more of listed species (Greater Yellowlegs, Lesser Yellowlegs, Marbled Godwit, Hudsonian Godwit, Black-bellied Plover, American Golden Plover, Semipalmated Plover, Solitary Sandpiper, Spotted Sandpiper, Semipalmated Sandpiper, Pectoral Sandpiper, White-rumped Sandpiper, Baird's Sandpiper, Least Sandpiper, Purple Sandpiper, Stilt Sandpiper, Short-billed Dowitcher, Red-necked Phalarope, Whimbrel, Ruddy Turnstone, Sanderling, Dunlin) and >1000 shorebird use days during spring or fall migration period • >100 Whimbrel for 3 or more years is considered significant	• Studies were completed during the spring migratory season. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for stopover driving transects and point counts • Stopover counts were conducted by driving a set transect, stopping at candidate habitats and conducting shorebird counts to estimate numbers and species • Counts were timed to coincide with peak numbers (dates and times)	• April-May
Raptor Wintering Area	• One or more Short-eared Owls or at least 10 individuals of two of the listed species (Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, and Snowy Owl) • Site must be used regularly (3 in 5 years) for a minimum of 20 days	• Studies were completed during the winter roosting season. Evaluation methods followed MNR protocols for raptor wintering area surveys • Walking transects were conducted along the interface of upland and forest transects once per week at each location, during daylight hours • Driving transects were also conducted between habitats to supplement data	• November - March
Turtle Overwintering	• Presence of 5 over-wintering Midland Painted Turtles, or 1 Northern Map Turtle or Snapping Turtle • Mapped ELC ecosite area with the over-wintering turtles is the	• Studies will be completed during warm, sunny days spring when turtles are exiting hibernation sites • Area searches for basking turtles will be conducted	• spring (March-May)

Table 4.1: Criteria and Methods Used to Evaluate Seasonal Concentration Areas of Animals

Candidate Seasonal Concentration Area	Criteria	Methods	Seasonal Timing
	significant wildlife habitat	throughout the habitat, concentrating on areas with more basking potential (ex. floating logs) and near deeper pools within the habitat • This habitat will be evaluated prior to construction	
Landbird Migratory Stopover Areas	• Studies confirm the use of the woodlot by >200 birds/day and with >35 species with at least 5 different survey dates.	• Studies were completed during spring and fall migration periods. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for line transect sampling • A combination of standardized walking transects established within and along the edge of candidate habitat, were conducted in the early morning hours.	• spring (April-May) and fall migration period (August-October)
Migratory Butterfly Stopover Area	• Presence of >5000 Monarch Use Days (MUD) or >3000 with White Admirals or Painted Ladies present is considered significant.	• Studies were conducted during fall migration. A combination of point counts and driving transects established within and along the edge of candidate habitat, were conducted on sunny afternoons.	• August-October

4.1.3.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

The criteria and methods used to evaluate the significance of candidate significant wildlife habitat for rare vegetation communities or specialized habitat for wildlife in and within 120 m of the Project Location are presented in **Table 4.2.**

Table 4.2: Criteria and Methods Used to Evaluate Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Community or Specialized Habitat for Wildlife	Criteria	Methods	Seasonal Timing
Old Growth Forest	• Studies determine if dominant tree species of the ecosite are >140 years old • Old growth forest stands will have experienced no recognizable forestry activities	• Determination of age of forest stand was determined during ELC surveys, including vegetation type and boundaries of ecosite • Historical air photos were used to assist in determining the age of each woodland (Northway-Photomap Remote Sensing Ltd. 1948)	• Summer
Waterfowl Nesting Areas	• Presence of 3 or more nesting pairs for listed species (i.e., American Black Duck, Northern Pintail, Northern Shoveler, Gadwall, Blue-winged Teal, Green-winged Teal, Wood Duck, Hooded Merganser and Mallard) excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant.	• Nesting studies were completed during the spring breeding season. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for area searches and point counts • A field study confirming waterfowl nesting habitat was used to determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest.	• Early June
Woodland Raptor Nesting	• Presence of 1 or more active nests from listed species (Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk) is considered significant	• A search for stick nests during vegetation classification was conducted, which were then monitored in early spring • Nesting studies were completed during the spring breeding season. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for behavioural studies.	• mid-March to end of May
Amphibian Breeding Habitat (Woodland)	• Presence of breeding population of 1 or more of the listed salamander species (i.e., Eastern Newt, Blue-spotted Salamander or Spotted Salamander) or 2 or more of the listed frog species (i.e., Gray Treefrog, Spring Peeper, Western Chorus Frog or Wood Frog) with at least 20 individuals (adults, juveniles, eggs/larval masses). • The habitat is the woodland (ELC polygons) and wetland (ELC	• Studies to determine breeding/larval stages were conducted during the spring when amphibians were concentrated around suitable breeding habitat within or near the woodland. • Evaluation methods followed the 'Marsh Monitoring Protocol' (BSC 2003).	• April-June

Table 4.2: Criteria and Methods Used to Evaluate Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Community or Specialized Habitat for Wildlife	Criteria	Methods	Seasonal Timing
	polygons) combined, or in the case of a wetland, the wetland and shoreline. • A travel corridor connecting the woodland and wetland polygons is to be included in the habitat.		
Amphibian Breeding Habitat (Wetland)	• Presence of breeding population of 1 or more of the listed salamander species (i.e., Eastern Newt, Blue-spotted Salamander, Four-toed Salamander or Spotted Salamander) or 2 or more of the listed frog species (i.e., American toad, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog, Gray Treefrog, or Western Chorus Frog) with at least 20 individuals (adults, juveniles, eggs/larval masses). • The ELC ecosite wetland area and shoreline are included in the habitat	• Studies to determine breeding/larval stages were conducted during the spring when amphibians were concentrated around suitable breeding habitat within or near the woodland. • Evaluation methods followed the 'Marsh Monitoring Protocol' (BSC 2003).	• April-June

4.1.3.3 Habitat for Species of Conservation Concern

The criteria and methods used to evaluate the significance of candidate significant wildlife habitat for species of conservation concern for wildlife in and within 120 m of the Project Location are presented in **Table 4.3**.

Table 4.3: Criteria and Methods Used to Evaluate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods	Seasonal Timing
Marsh Breeding Bird Habitat	• Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes or breeding by any combination of 5 or more of the listed species (American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan). • Any site with breeding or 1 or more Black Terns, Trumpeter Swan, Green Heron, or Yellow Rail is SWH	• Studies were completed in spring and early summer when birds were singing and defending their territories. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts • Standardized point counts were conducted within the candidate habitat during the early morning hours.	• May-June
Woodland Area-Sensitive Bird	• Presence of nesting or breeding	• Studies were completed in	• May-

Table 4.3: Criteria and Methods Used to Evaluate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods	Seasonal Timing
Breeding Habitat	pairs of 3 or more of the listed species (Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren) • Based on information collected by Stantec regarding area-sensitivity of songbird species (those requiring >30 ha of continuous habitat, see **Table 2B, Appendix B**), the following species were also considered under this habitat: Acadian Flycatcher, Brown Creeper, Blue-gray Gnatcatcher, Black-and-white Warbler, and Mourning Warbler • Any site with breeding Cerulean Warbler or Canada Warbler is significant	spring and early summer when birds were singing and defending their territories. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts • Standardized point counts were conducted within the candidate habitat during the early morning hours.	June
Open Country Bird Breeding Habitat	• Presence of nesting or breeding of 2 or more of the listed species (Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow) or a field with 1 or more breeding Short-eared Owl is considered significant wildlife habitat • Area of the significant wildlife habitat is contiguous ELC ecosite field areas • Swallow migratory staging is not included in the draft Ecoregion 6E Criteria as a significant wildlife habitat, but for the purposes of this study, it was included under open country breeding bird habitat as providing the ecological functions required for staging swallows	• Studies were completed in spring and early summer when birds were singing and defending their territories. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts and line transects • Staging swallow surveys were conducted during fall migration when swallows are migrating south, staging before crossing Lake Ontario. • Standardized point counts and walking transects were conducted within the candidate habitat during the early morning hours.	• May-June (grassland birds) • July-September (staging swallows)
Shrub/Early Successional Bird Breeding Habitat	• Presence of nesting or breeding of 1 of the indicator species (Brown Thrasher, Clay-coloured Sparrow) and at least 2 of the common species (Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher), or a field with breeding Yellow-breasted Chat or Golden-winged Warbler is considered	• Studies were completed in spring and early summer when birds were singing and defending their territories. Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts and line transects	• May-June

Table 4.3: Criteria and Methods Used to Evaluate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods	Seasonal Timing
	significant • Area of the significant wildlife habitat is the contiguous ELC ecosite field/thicket area	• Standardized point counts and walking transects were conducted within the candidate habitat during the early morning hours	
Special Concern and Rare Wildlife Species	• Presence of Louisiana Waterthrush	• Field investigations were conducted in the identified habitats in late spring and early summer when birds were singing and defending their territories. • Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts	• May-June
	• Presence of nesting Short-eared Owl	• Field investigations were conducted in the identified habitats in late spring and early summer when birds were singing and defending their territories. • Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts	• May-June
	• Presence of Wilson's Phalarope	• Field investigations were conducted in the identified habitats in late spring and early summer when birds were singing and defending their territories. • Evaluation methods followed "Bird and Bird Habitats: Guidelines for Wind Power Projects" for standardized point counts	• May-June

4.2 RESULTS

Results of the Evaluation of Significance for wetlands and woodlands are shown in **Figure 5.0-5.5, Appendix A** and outlined in **Tables 9B** and **10B, Appendix B**. The locations of individual features relative to the Project Location are shown on these figures. The following sections summarize the results of the Evaluation of Significance for natural features within 120 m of the Project Location.

4.2.1 Wetlands

Two wetlands assessed by MNR as provincially-significant occurred within 120 m of the Project Location: the Nut Island Duck Club Marsh (Wetland 10a) and the Long Point Marsh (Wetland 21).

Twenty unevaluated wetlands, not previously identified by MNR, were identified within 120 m of the Project Location during site investigations. These communities were evaluated using the *Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects* described in **Section 4.1.1**. All wetlands except Wetlands 6 and 7 assessed under this protocol are being treated as significant for the purposes of the NHA and Project siting. **Table 9B, Appendix B** provides the evaluations of these wetland communities. Rare species information is addressed through the Habitat for Species of Conservation Concern evaluation, **Section 4.2.3.3**.

No Project components are proposed in, on, or over a wetland, with the exception of underground cabling and access roads crossing a small portion of Wetlands 6 and 7. These two wetlands were evaluated under the OWES and found to be not provincially-significant. Details regarding these assessments are provided in **Appendix E**. These two wetlands are not considered significant and will not be carried forward to the EIS.

An EIS has been completed for those significant wetlands where the Project Location is proposed within 120 m of the feature (Section 5.4.2).

4.2.2 Woodlands

Criteria for woodland significance were applied to each of the Woodland Features located within 120 m of the Project Location. Results of the evaluation are provided in **Table 10B, Appendix B**. Fifteen of the woodlands met the criteria for significance based on criteria standards within the NHA Guide for Renewable Energy Projects. These included Features 1, 2, 3, 4, 7, 9, 10, 15, 18, 20, 21, 23, 28, 32, and 36.

The 15 significant woodlands located within 120 m of the Project Location are shown on **Figures 5.1-5.5, Appendix A**. Significant woodlands within 120 m of the Project Location will be included in the EIS. The Project Location is proposed to occur in three significant woodlands (Woodlands 4, 9, and 36). An access road and underground cabling are proposed to cross a thin section of Woodland 9, removing 0.099 ha temporarily and 0.06 ha permanently of woodland habitat. The Project Location also crosses through a gap in Woodland 4, which is currently a ploughed tractor path. Underground cabling is proposed to pass through this gap, and no trees within the woodland are proposed for removal in Woodland 4. A portion of a hedgerow associated with Woodland 36 is proposed for removal as part of the temporary laydown area on the mainland, removing 0.181 ha temporarily of woodland habitat.

An Environmental Impact Study has been completed for those significant woodlands where the Project Location is proposed in or within 120 m of the feature (Section 5.4.1).

4.2.3 Wildlife and Wildlife Habitat

Four seasons of extensive wildlife surveys were completed throughout Amherst Island in order to better understand the potential impacts of the proposed Amherst Island Wind Project on local and migratory wildlife. A complete, overall list of species observed during field surveys is provided in **Table A, Appendix F**.

Staging Waterfowl

Results of the spring and fall staging waterfowl surveys are provided in **Table B, Appendix F**. A total of 25 waterfowl species were observed between the spring and fall surveys, including 8 species of dabbling ducks, 5 bay ducks, 3 mergansers, 3 goldeneye, 2 goose, 2 swans and 2 sea ducks.

The most common species found inland were Canada Geese (9047 individuals), Common Goldeneye (1247 individuals), Greater Scaup (701 individuals), and Red-breasted Merganser (699 individuals).

The most common species found offshore were Common Goldeneye (4255 individuals), Canada Goose (2763 individuals), Red-breasted Merganser (1568 individuals), and Bufflehead (1304 individuals).

Small pockets of waterfowl were observed in bays along the shoreline of Amherst Island, although the most significant area for migrating waterfowl was observed to be the waters between the island and the mainland.

Staging Shorebirds

Results of the spring staging shorebird surveys are provided in **Table C, Appendix F**. Fifteen species of shorebird were observed, the most common species being Dunlin (a total of 366 individuals observed), followed by Semi-palmated Sandpiper (36 individuals), Spotted Sandpiper (25 individuals), and Least Sandpiper (10 individuals).

The majority of these observations (92% of individuals observed) were made at the Amherst bar on the Kingston Field Naturalists property.

Winter Raptors

Wintering raptors were found throughout the Study Area, most commonly observed hunting in the open woodlands. Results of the winter raptor surveys are found in **Table D, Appendix F**. In

total the winter raptor surveys recorded 11 species of raptors and owls and one predatory songbird, the Northern Shrike, within the Study Area.

Short-eared Owl was the most common species observed, with a total of 242 observations over the 18 surveys. Other commonly observed species include Rough-legged Hawk, Northern Harrier and Red-tailed Hawk with respective totals of 199, 128 and 119 observations over the 18 surveys.

The highest one day totals observed during the driving transect surveys, which provide a conservative estimate of raptors using the Study Area; include 37 Rough-legged Hawks, 22 Red-tailed Hawks, 20 Northern Harriers, 2 American Kestrels, 2 Snowy Owls and 23 Short-eared Owls.

Generally, observations of hunting raptors were spread out around the Study Area, with some of the higher concentrations observed in the western portion of the island, along 2nd Concession Rd, south of Stella, along Front Rd and between Marshall 40 Foot Rd and Lower 40 Foot Rd.

Two Bald Eagles were observed throughout the study period, both on Feb 7, 2012. Both of the observations were made along the south shoreline, outside of the Zone of Investigation, one in the vicinity of the Long Point Marsh PSW, and the other along the coastline at the east end of the island. Other raptor species observed in smaller numbers include Cooper's Hawk, Merlin, and Red-shouldered Hawk; all of which were likely migrants.

Several Short-eared Owl roost were identified throughout the open grassland habitat within the Study Area ranging in use of a single individual to 28 individuals. There was generally some shifting in ground roosting sites between surveys. Some larger sites were relatively consistently used, with shifting within the site. Some smaller roost site did not appear to be consistently used on different surveys.

Numbers of Northern Saw-whet Owls and Long-eared Owls were relatively low on Amherst Island in the winter of 2011/2012, as a result roost likely under-represented these species. However, significant roost sites were identified using historical knowledge of the Study Area, and signs of past use such as pellets.

Migratory Landbirds

Songbirds

Results of the migratory landbird surveys are provided in **Table E, Appendix F**. During the spring surveys, a total of 4572 individuals were observed over 129 species. Red-winged Blackbirds were the most common species observed (a total of 516 individuals), followed by Yellow Warbler (303 individuals), American Robin (292 individuals), and Song Sparrow (290 individuals). Several species of conservation concern were observed migrating through the Study Area during fall migration, including Canada Warbler (3 individuals), Olive-sided

Flycatcher (2 individuals), Red-headed Woodpecker (1 individual), Golden-winged Warbler (1 individual), Prairie Warbler (1 individual), Hooded Warbler (1 individual), and Cerulean Warbler (1 individual).

Observations of migrants were also made during the fall surveys, with a total of 5174 individuals over 107 species. European Starlings were the most common species observed (a total of 1082 individuals), followed by White-throated Sparrow (444 individuals), American Robin (432 individuals), and Song Sparrow (380 individuals). No species of conservation concern were observed.

Swallows

Concentrations of swallows are known to stage on Amherst Island during their fall migration. Results of the staging swallow surveys can be found in **Table I, Appendix F**. Staging Swallow were most commonly observed either flying over open country areas or resting on hydro wires along roadsides. The largest flock of swallows were a flock of 800 Tree Swallows observed along the southern edge of the island next to the Long Point Marsh PSW on August 9, 2011. In general, the majority of the birds were observed within 100 m of the shoreline, and along the southern shoreline of the island, including in the vicinity of the Amherst Bar.

Over the nine driving transect surveys that were conducted between the period of mid-July to mid-September, a total of 11, 240 swallow observations were made. Six species of swallow were observed in numbers: Bank Swallow (2682 individuals), Barn Swallow (2378 individuals), Cliff Swallow (3 individuals), Northern Rough-winged Swallow (110 individuals), Purple Martin (160 individuals), and Tree Swallow (6087 individuals). The largest numbers of swallows were seen in late-July and early-August.

Raptors

During the spring migration, relatively few raptors were observed during the field surveys. The most common species included Northern Harrier (11 individuals), Red-tailed Hawks (11 individuals) and Turkey Vultures (5 individuals).

Targeted raptors surveys were conducted during the fall migration period, with 14 surveys conducted between early September and early December. In total, 14 species were observed; the most commonly observed species include Northern Harrier, American Kestrel, Red-tailed Hawk and Rough-legged Hawk, with respective total of 214, 192, 185 and 166 individuals observed over the 14 surveys.

Amphibians

Amphibian surveys were completed from April to June 2011 in wetland habitats and vernal pools. Most wetland habitat within the Study Area consisted of low depressions with wetland vegetation, but lacked the standing water that would support breeding amphibians. Most of the

amphibian breeding habitat within the Study Area occurred in the large coastal wetlands in the southwestern portion of the Study Area.

Results of the amphibian surveys are found in **Table F, Appendix F**. Results of the field surveys found seven species of amphibians within the Study Area over 24 stations: Northern Leopard Frog, Wood Frog, Western Chorus Frog, Spring Peeper, Bullfrog, Green Frog, and American Toad.

Spring Peeper and Western Chorus Frog were generally the most common species; the shallow water wetlands found within the Study Area are generally consistent with the breeding requirements of these two species. Bullfrog, an area sensitive species which requires permanent water, was restricted to the Long Point Marsh PSW.

Breeding Birds

In the late spring and early summer of 2011, extensive breeding bird surveys were conducted in all natural habitats, including open country, woodland, and wetlands. A complete list of all birds observed is provided in **Tables G, Appendix F**. The fifteen most abundant species in the study area and in each habitat type, determined from calculated species densities, are summarized in **Table 4.4** below.

Table 4.4: Abundant bird species based on density, by habitat type

Grassland		Woodland		Marsh	
Species	**Density/ 10 ha**	**Species**	**Density/ 10 ha**	**Species**	**Density/ 10 ha**
Savannah Sparrow	10.67	American Robin	3.93	Red-winged Blackbird	18.05
Red-winged Blackbird	6.21	Red-winged Blackbird	3.56	European Starling	15.92
Tree Swallow	3.11	Song Sparrow	3.37	Mallard	10.08
Song Sparrow	2.79	Rose-breasted Grosbeak	3.00	Swamp Sparrow	10.08
European Starling	2.71	Common Grackle	3.00	Herring Gull	9.55
Eastern Kingbird	2.39	Red-eyed Vireo	2.62	American Wigeon	4.25
Yellow Warbler	1.75	European Starling	2.62	Wilson's Phalarope	3.18
Ring-billed Gull	1.19	Eastern Wood-Pewee	2.44	Killdeer	3.18
American Robin	1.19	Blue Jay	2.25	Wilson's Snipe	3.18
Grasshopper Sparrow	0.72	House Wren	2.25	Ring-billed Gull	3.18
Northern Harrier	0.64	Gray Catbird	2.25	Yellow Warbler	3.18
Wilson's Snipe	0.56	Yellow Warbler	2.25	Common Yellowthroat	3.18
American Goldfinch	0.56	Swamp Sparrow	1.50	Gadwall	2.65
Cedar Waxwing	0.48	Great Crested Flycatcher	1.31	Savannah Sparrow	2.65
Common Yellowthroat	0.48	Wood Thrush	1.31	Tree Swallow	2.12

Thirty-nine species were observed during point counts in hay and pasture habitat, including a number of species of conservation concern and Species at Risk. Savannah Sparrow and Red-winged Blackbird were the most abundant species observed in open country habitat with respective densities of 10.67 pairs and 6.21 pairs/10 ha. These results are in agreement with other studies, as Red-winged Blackbird, and Savannah Sparrow were also the most abundant

species observed in field habitat elsewhere, including New York hayfields (Bollinger 1995) and in Minnesota grasslands (Leddy et al. 1999).

Fifty-four species were observed during point counts in woodland habitat. No single species was observed at a particularly high density. The most common species were American Robin, Red-winged Blackbird, and Song Sparrow with densities of 3.93, 3.56 and 3.37 pairs/10 ha, respectively. Other common species were Rose-breasted Grosbeak and Common Grackle with densities of 3.00 pairs/10 ha for both species. The Red-winged Blackbird observations were generally located at the edges of forest habitat rather than within.

Forty-two species were observed during point counts in marsh habitat. Red-winged Blackbird was by far the most abundant species with a density of 18.05 pairs/10 ha. This was the highest density of any species across all habitat types. The next most abundant species, European Starling and Mallard, were recorded at lower densities (15.92 and 10.08 pairs/10 ha respectively). Herring Gulls were also common with a density of 9.55 pairs/10 ha.

The following sections provide data analysis specific to the candidate significant wildlife habitats found within the Zone of Investigation of the Amherst Island Wind Project.

4.2.3.1 Seasonal Concentration Areas

Evaluations of significance for candidate SWH for seasonal concentration areas within 120 m of the Project Location are presented in **Table 4.5**. Field notes are provided in **Appendix C**. A detailed table of results for each type of survey is provided in **Appendix F**.

Table 4.5: Summary of Evaluation of Significance Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Waterfowl Stopover and Staging Areas (Terrestrial)	Yes	**WT1**: Over 10 surveys in the spring and 8 surveys in the fall, none of the listed species were observed. A congregation of 100 individuals of the listed species in one day is considered significant. This is therefore not a significant waterfowl terrestrial stopover and staging area. **WT2**: Over 10 surveys in the spring and 8 surveys in the fall, none of the listed species were observed. A congregation of 100 individuals of the listed species in one day is considered significant. This is therefore not a significant waterfowl terrestrial stopover and staging area. **WT3**: Over 10 surveys in the spring and 8 surveys in the fall, none of the listed species were observed. A congregation of 100 individuals of the listed species in one day is considered significant. This is therefore not a significant waterfowl terrestrial stopover and staging area.	No (WT1, WT2, WT3 and WT4)

Table 4.5: Summary of Evaluation of Significance Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		WT4: Over 10 surveys in the spring and 8 surveys in the fall, the highest daily total of listed waterfowl species was 2. A congregation of 100 individuals of the listed species in one day is considered significant. This is therefore not a significant waterfowl terrestrial stopover and staging area.	
Waterfowl Stopover and Staging Areas (Aquatic)	No	**WA1**: Over 8 surveys in the fall, the highest daily total of waterfowl individuals was 20. A congregation of 100 individuals is considered significant. This is therefore not a significant waterfowl terrestrial stopover and staging area.	No (WA1)
Shorebird Migratory Stopover Area	No	**SM1**: A total of 460 shorebirds were seen over 5 survey dates in May 2011. The largest concentration was 365 Dunlin observed on May 26, 2011, at the Amherst Bar. The IBA report also lists higher concentrations of shorebirds at the Amherst Bar in previous years (IBA Canada undated). This habitat is therefore considered a significant shorebird migratory stopover area.	Yes (SM1)
Raptor Wintering Area	Yes	**RWA1**: A total of 60 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 38 Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA2**: A total of 353 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 89 Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA3**: A total of 101 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 31 Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA4**: A total of 3 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, all Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA5**: A total of 49 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 20 Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA6**: A total of 122 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 47 Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA7**: A total of 36 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 4 Short-eared Owls. This is, therefore, significant wildlife habitat.	Yes (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7 and RWA8) and No (RWA9 and RWA10)

Table 4.5: Summary of Evaluation of Significance Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		RWA8: A total of 21 individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat, including 10 Short-eared Owls. This is, therefore, significant wildlife habitat. **RWA9:** A total of 1 individual of the listed raptor species was observed during walking and driving transects conducted in this habitat. This is, therefore, not significant wildlife habitat. **RWA10:** No individuals of the listed raptor species were observed during walking and driving transects conducted in this habitat. This is, therefore, not significant wildlife habitat.	
Turtle Overwintering	Unknown	Evaluation of significance surveys have not yet been completed; this habitat will be treated as significant. These surveys will be conducted prior to construction and are further described in the Environmental Impact Study (Section 5.5.3.3).	Yes (TO1)
Landbird Migratory Stopover Areas	Yes	**ML1**: Over 6 survey dates in the spring, the following numbers of individuals were observed: 66, 48, 126, 49, 76, and 36 with the following number of species: 23, 20, 38, 23, 27, and 17. A total of 57 species were observed over all of the survey dates in the spring. Over 7 survey dates in the fall, the following numbers of individuals were observed: 3, 10, 38, 34, 20, 24, and 50 with the following number of species: 2, 3, 10, 6, 7, 9, and 5. A total of 23 species were observed over all of the survey dates in the fall. **ML2**: Over 6 survey dates in the spring, the following numbers of individuals were observed: 62, 46, 33, 29, 88, and 63 with the following number of species: 23, 17, 14, 20, 36, and 23. A total of 57 species were observed over all of the survey dates in the spring. Over 8 survey dates in the fall, the following numbers of individuals were observed: 17, 13, 24,12, 85, 29, 23, and 60 with the following number of species: 7, 7, 12, 4, 18, 9, 7, and 17. A total of 45 species were observed over all of the survey dates in the fall. **ML3**: Over 6 survey dates in the spring, the following numbers of individuals were observed: 111, 67, 63, 55, 62, and 59 with the following number of species: 17, 11, 22, 20, 28, and 22. A total of 46 species were observed over all of the survey dates in the spring. Over 8 survey dates in the fall, the following numbers of individuals were observed: 30, 25, 25, 12, 35, 42, 43, and 17 with the following number of species: 9, 9, 16, 6, 14, 12, 12, and 8. A total of 35 species were observed over all of the survey dates in the fall. **ML4**: Over 6 survey dates in the spring, the following numbers of individuals were observed: 26, 32, 36, 34, 44,	Yes (ML1, ML2, ML3, ML4 and ML5)

Table 4.5: Summary of Evaluation of Significance Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		and 61 with the following number of species: 11, 16, 18, 17, 19, and 24. A total of 45 species were observed over all of the survey dates in the spring. Over 7 survey dates in the fall, the following numbers of individuals were observed: 26, 46, 28, 159, 107, 94, and 112 with the following number of species: 11, 15, 13, 19, 17, 16, and 21. A total of 45 species were observed over all of the survey dates in the fall. **ML5**: Over 6 survey dates in the spring, the following numbers of individuals were observed: 60, 40, 64, 45, 53 and 36 with the following number of species: 21, 15, 25, 17, 18 and 15. A total of 47 species were observed over all of the survey dates in the spring. Over 8 survey dates in the fall, the following numbers of individuals were observed: 46, 38, 40, 15, 108, 99, 24 and 197 with the following number of species: 24, 14, 14, 13, 20, 22, 14 and 31. A total of 59 species were observed over all of the survey dates in the fall. Although the number of species using these woodlands meet the criteria, there were not >200 birds/day for 5 days observed at any one woodland. However, because the transects covered less than 25% of the woodland area, we are considering 50 individuals observed per day on each transect to be significant. Therefore, all five habitats are considered significant.	
Migratory Butterfly Stopover Area	No	**MB2**: Occasional Monarch butterflies were noted during two surveys in August 2011; however, no large flocks or numbers were observed. This is therefore not significant migratory butterfly stopover habitat. **MB3:** Occasional Monarch butterflies were noted during two surveys in August 2011; however, no large flocks or numbers were observed. This is therefore not significant migratory butterfly stopover habitat.	No (MB2, MB3)

4.2.3.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Evaluations of significance for candidate SWH for rare vegetation communities or specialized habitat for wildlife within 120 m of the Project Location are presented in **Table 4.6**. Detailed table of results for each type of survey is provided in **Appendix F**.

Table 4.6: Summary of Evaluation of Significance Results for Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Communities or Specialized Habitat for Wildlife	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Old Growth Forest	Yes	**OGF1**: This Sugar Maple – Beech Deciduous Forest was classified as mature. There were no trees with a dbh larger than 50 cm. This forest was present and mature in the 1948 historical air photos (Northway-Photomap Remote Sensing Ltd 1948); therefore, this forest is greater than 70 years old. There was no evidence of forestry noted during ELC surveys. This forest is therefore considered old growth. **OGF2**: This Sugar Maple Deciduous Forest was classified as mature. There were rarely trees with a dbh larger than 50 cm. This forest was present and mature in the 1948 historical air photos (Northway-Photomap Remote Sensing Ltd 1948); therefore, this forest is greater than 70 years old. There was no evidence of forestry noted during ELC surveys. This forest is therefore considered old growth. **OGF3**: This Green Ash Lowland Forest was classified as mature. There were rarely trees with a dbh larger than 50 cm. This forest was present and mature in the 1948 historical air photos (Northway-Photomap Remote Sensing Ltd 1948); therefore, this forest is greater than 70 years old. There was no evidence of forestry noted during ELC surveys. This forest is therefore considered old growth.	Yes (OGF1, OGF2, OGF3)
Waterfowl Nesting Areas	No	**WN1**: Two of the indicator species were observed during breeding bird surveys: Mallard and Wood Duck. This type of habitat requires breeding evidence of three or more listed species, excluding mallard, to be considered significant. Therefore, this habitat is not a significant waterfowl nesting area. **WN2**: Two of the indicator species were observed during breeding bird surveys: Mallard and Wood Duck. This type of habitat requires breeding evidence of three or more listed species, excluding mallard, to be considered significant. Therefore, this habitat is not a significant waterfowl nesting area.	No (WN1, WN2)
Woodland Raptor Nesting Habitat	No	**WR1**: One stick nest was found in this habitat during ELC surveys. It was confirmed in spring 2011 to be an active Red-tailed Hawk nest. Because this is not a listed species for this habitat, this is not significant woodland raptor nesting habitat. **WR2**: No stick nests were found in this habitat during ELC surveys. Therefore, this is not significant woodland raptor nesting habitat.	No (WR1, WR2)
Amphibian	Yes	**ABWO1**: Two species of anurans (Spring Peeper and	Yes (ABWO2

Table 4.6: Summary of Evaluation of Significance Results for Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Communities or Specialized Habitat for Wildlife	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Breeding Habitat (Woodland)		American Toad) were observed in this feature, with 3 individuals heard calling. Two or more of the listed frog species with at least 20 individuals confirms significant amphibian breeding habitat (woodland). This is therefore not significant amphibian breeding habitat. **ABWO2**: Five species of anurans, including Western Chorus Frog, were observed in this feature, with more than 20 individuals. Two or more of the listed frog species with at least 20 individuals confirms significant amphibian breeding habitat (woodland). This is therefore significant amphibian breeding habitat. **ABWO3**: Two species of anuran (Gray Treefrog and Spring Peeper) were observed in this feature, with greater than 20 individuals in total. Two or more of the listed frog species with at least 20 individuals confirms significant amphibian breeding habitat (woodland). This is therefore significant amphibian breeding habitat.	and ABWO3) And No (ABWO1)
Amphibian Breeding Habitat (Wetland)	Yes	**ABWE1**: Six species of anurans, including western chorus frog, were observed in this feature, with more than 20 individuals. Two or more of the listed frog species with at least 20 breeding individuals confirms significant amphibian breeding habitat (woodland). This is therefore significant amphibian breeding habitat. **ABWE2**: Three species of anurans (American toad, spring peeper, and western chorus frog) were observed in this feature, with more than 20 individuals observed. Two or more of the listed frog species with at least 20 breeding individuals confirms significant amphibian breeding habitat (woodland). This is therefore significant amphibian breeding habitat.	Yes (ABWE1, ABWE2)

4.2.3.3 Habitat for Species of Conservation Concern

Evaluations of significance for candidate SWH for rare vegetation communities or specialized habitat for wildlife within 120 m of the Project Location are presented in **Table 4.7**. Detailed table of results for each type of survey is provided in **Appendix F**.

Table 4.7: Summary of Evaluation of Significance Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Marsh Breeding Bird Habitat	Yes	**MBB1**: Five of the listed species were observed with breeding evidence during breeding bird surveys in this habitat: Common Loon, American Bittern, Green Heron, Marsh Wren, and Yellow Rail. The presence of 4 or more of the listed species indicates significant marsh breeding bird habitat. This habitat is therefore significant wildlife habitat.	Yes (MBB1)
Woodland Area-Sensitive Bird Breeding Habitat	Yes	**ABB1**: Four of the species listed in the Ecoregion criteria were observed with breeding evidence during breeding bird surveys: Yellow-bellied Sapsucker, Scarlet Tanager, Black-throated Green Warbler, and Veery. The presence of 3 or more listed species observed with breeding evidence indicates significant area sensitive bird breeding habitat. This habitat is therefore significant woodland area-sensitive bird breeding habitat, and it contains >4 ha of interior habitat, calculated 200 m from the habitat edge. **ABB2**: Two of the species listed in the Ecoregion criteria were observed with breeding evidence during breeding bird surveys: Yellow-bellied Sapsucker and Veery. The presence of 3 or more listed species observed with breeding evidence indicates significant area sensitive bird breeding habitat. This habitat is therefore not significant woodland area-sensitive bird breeding habitat.	Yes (ABB1) And No (ABB2)
Open Country Bird Breeding Habitat	Yes	**OCB1**: Three listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. In addition, 15 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB2**: Three listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. Short-eared Owls have also been observed nesting in this habitat (Keyes 2011). In addition, 286 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB3**: Three listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. In addition, 19 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB4**: Three listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. In addition, 1596 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB5**: Three listed species were observed during breeding	Yes (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB9)

Table 4.7: Summary of Evaluation of Significance Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. Short-eared Owls have also been observed nesting in this habitat (Keyes 2011). In addition, 250 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB6**: Three listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. In addition, 148 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB7**: Four listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, Short-eared Owl, and Savannah Sparrow. In addition, 2923 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB8**: Three listed species were observed during breeding bird surveys: Upland Sandpiper, Grasshopper Sparrow, and Savannah Sparrow. Short-eared Owls have also been observed nesting in this habitat (Keyes 2011). In addition, 2211 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat. **OCB9:** Two listed species were observed during breeding bird surveys: Upland Sandpiper and Savannah Sparrow. Short-eared Owls have also been observed nesting in this habitat (Keyes 2011). In addition, 2253 staging swallows were observed over 9 swallow surveys. This feature is therefore significant open country breeding bird habitat.	
Shrub/Early Successional Bird Breeding Habitat	Yes	**SSB1**: One of the listed indicator species (Brown Thrasher) and four of the listed common species (Field Sparrow, Eastern Towhee, Willow Flycatcher, and Black-billed Cuckoo) were observed in this habitat during breeding bird surveys. No species of special concern were observed. The presence of 1 of the indicator listed species and 2 of the common listed species indicate significant shrub/early successional bird breeding habitat. This is therefore significant shrub/early successional bird breeding habitat. **SSB2**: Three of the listed common species (Black-billed Cuckoo, Eastern Towhee, and Willow Flycatcher) were observed in this habitat during breeding bird surveys. No indicator species or species of special concern were observed. The presence of 1 of the indicator listed species and 2 of the common listed species indicate significant	Yes (SSB1, SSB3, SSB4 and SSB5) and No (SSB2)

Table 4.7: Summary of Evaluation of Significance Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120 m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		shrub/early successional bird breeding habitat. This is therefore not significant shrub/early successional bird breeding habitat. **SSB3**: One of the listed indicator species (Brown Thrasher) and two of the listed common species (Eastern Towhee and Willow Flycatcher) were observed in this habitat during breeding bird surveys. No species of special concern were observed. The presence of 1 of the indicator listed species and 2 of the common listed species indicate significant shrub/early successional bird breeding habitat. This is therefore significant shrub/early successional bird breeding habitat. **SSB4:** One of the listed indicator species (Brown Thrasher) and three of the listed common species (Field Sparrow, Eastern Towhee and Willow Flycatcher) were observed in this habitat during breeding bird surveys. No species of special concern were observed. The presence of 1 of the indicator listed species and 2 of the common listed species indicate significant shrub/early successional bird breeding habitat. This is therefore significant shrub/early successional bird breeding habitat. **SSB5:** One of the listed indicator species (Brown Thrasher) and three of the listed common species (Field Sparrow, Eastern Towhee and Willow Flycatcher) were observed in this habitat during breeding bird surveys. No species of special concern were observed. The presence of 1 of the indicator listed species and 2 of the common listed species indicate significant shrub/early successional bird breeding habitat. This is therefore significant shrub/early successional bird breeding habitat.	
Louisiana Waterthrush	No	Louisiana Waterthrush was not observed during breeding bird surveys in any of the candidate significant habitats (LW1, LW2, and LW3). Therefore, none of these habitats are significant for this species.	No (LW1, LW2, LW3)
Short-eared Owl	Yes	This species was observed at each of the open country breeding bird habitats (**OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8,** and **OCB9**). Therefore, each of these features are considered significant Short-eared Owl habitat.	Yes (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, OCB9)
Wilson's Phalarope	No	This species was not observed in or within 120 m of the Project Location on the KFN property in feature WP1. This species is more closely associated with the coastal marsh found within the wetland area in the eastern portion of this property.	No (WP1)

4.3 SUMMARY

This NHA was undertaken to identify natural features found in or within 120 m of the Project Location and evaluate their significance. Based on an Evaluation of Significance, significant natural features identified in and within 120 m of the Project Location are presented in **Table 4.8**.

Table 4.8: Summary of Evaluation of Significance of Natural Features

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Located in or within 120 m of Project Location	Significant? (Y/N)	Carried Forward to EIS (Y/N)
Wetlands					
1	Wetland	UL-74 AR-94	Within 120 m	Yes	Yes
2	Wetland	WT-41 UL-96 AR-52 TC-47	Within 120 m	Yes	Yes
3	Wetland	UL-3 TC-104 BU-3	Within 120 m	Yes	Yes
4	Wetland	WT - 76 UL-41 AR-38 TC-39	Within 120 m	Yes	Yes
5	Wetland	WT-5 UL-3 AR-11 TC-9	Within 120 m	Yes	Yes
8	Wetland	UL-28 AR-103	Within 120 m	Yes	Yes
9	Wetland	WT-68 UL-18 AR-99 TC-61	Within 120 m	Yes	Yes
10 (PSW)	Wetland – Nut Island Duck Club Marsh	WT-3 UL-13 AR-74 TC-3	Within 120 m	Yes	Yes
11	Wetland	WT-60 UL-115 AR-77 TC-62	Within 120 m	Yes	Yes
12	Wetland	WT-10 UL-4 AR-7 TC-3	Within 120 m	Yes	Yes
13	Wetland	UL-1 AR-100	Within 120 m	Yes	Yes
14	Wetland	UL-40 AR-44	Within 120 m	Yes	Yes
15	Wetland	UL-18	Within 120 m	Yes	Yes
16	Wetland	UL-19	Within 120 m	Yes	Yes

Table 4.8: Summary of Evaluation of Significance of Natural Features

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Located in or within 120 m of Project Location	Significant? (Y/N)	Carried Forward to EIS (Y/N)
		AR-10			
17	Wetland	UL-3	Within 120 m	Yes	Yes
18	Wetland	UL-62 AR-58	Within 120 m	Yes	Yes
19	Wetland	WT-62 UL-102 AR-107 TC-46	Within 120 m	Yes	Yes
20	Wetland	UL-24 AR-42	Within 120 m	Yes	Yes
21 (PSW)	Wetland – Long Point Marsh	WT-119 AR-78	Within 120 m	Yes	Yes
22	Wetland	TC - 29	Within 120 m	Yes	Yes
Woodlands					
1	Woodland	WT – 47 UL – 4 AR -7 TC – 3	Within 120 m	Yes	Yes
2	Woodland	UL-100	Within 120 m	Yes	Yes
3	Woodland	UL-20 AR-16	Within 120 m	Yes	Yes
4	Woodland	WT-48 UL-overlapping AR-3 TC-23	In	Yes	Yes
7	Woodland	UL-7 AR-8	Within 120 m	Yes	Yes
9	Woodland	UL-overlapping AR-overlapping	In	Yes	Yes
10	Woodland	WT-71 TC-83	Within 120 m	Yes	Yes
15	Woodland	WT-71 TC-71	Within 120 m	Yes	Yes
18	Woodland	UL-3	Within 120 m	Yes	Yes
20	Woodland	WT-67 UL-30 AR-34 TC-33	Within 120 m	Yes	Yes
21	Woodland	WT-44 UL-3 AR-39 TC-40	Within 120 m	Yes	Yes
23	Woodland	UL-28 AR-17 TC-81	Within 120 m	Yes	Yes
28	Woodland	UL-3 TC – 92 BU - 107	Within 120 m	Yes	Yes
32	Woodland	UL-18	Within 120 m	Yes	Yes
36	Woodland	UL – 3	In	Yes	Yes

Table 4.8: Summary of Evaluation of Significance of Natural Features

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Located in or within 120 m of Project Location	Significant? (Y/N)	Carried Forward to EIS (Y/N)
		TC – overlapping BU - overlapping			
ANSIs					
Wetland 21	Amherst Bay Life Science ANSI	WT-119 AR-78	Within 120 m	Yes	Yes
Seasonal Concentration Areas					
RWA-1	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
RWA-2	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
RWA-3	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
RWA-4	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
RWA-5	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
RWA-6	Raptor Wintering Area	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
RWA-7	Raptor Wintering Area	UL – 4 AR – 8	In	Yes	Yes
RWA-8	Raptor Wintering Area	UL – overlapping TC – 32 BU - 37	Within 120 m	Yes	Yes
TO-1	Turtle Overwintering	WT – 115 AR – 77 TC – 118	Within 120 m	Yes*	Yes
ML1	Landbird Migratory Stopover Areas	WT – 48 UL – 3 AR – 3 TC – 23	Within 120 m	Yes	Yes
ML2	Landbird Migratory Stopover Areas	WT – 71 TC – 83	Within 120 m	Yes	Yes

Table 4.8: Summary of Evaluation of Significance of Natural Features

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Located in or within 120 m of Project Location	Significant? (Y/N)	Carried Forward to EIS (Y/N)
ML3	Landbird Migratory Stopover Areas	WT – 71 TC – 71	Within 120 m	Yes	Yes
ML4	Landbird Migratory Stopover Areas	WT – 44 UL – 3 AR – 39 TC – 40	Within 120 m	Yes	Yes
ML5	Landbird Migratory Stopover Areas	UL – 28 AR – 17 TC – 81	Within 120 m	Yes	Yes
Rare Vegetation Communities and Specialized Habitat for Wildlife					
OGF1	Old Growth Forest	UL – 8	Within 120 m	Yes	Yes
OGF2	Old Growth Forest	WT – 48 UL – 103 AR – 98 TC – 50	Within 120 m	Yes	Yes
OGF3	Old Growth Forest	WT – 71 TC – 83	Within 120 m	Yes	Yes
ABWO2	Amphibian Breeding Habitat (Woodland)	UL - 59 AR – 54	Within 120 m	Yes	Yes
ABWO3	Amphibian Breeding Habitat (Woodland)	TC -29	Within 120 m	Yes	Yes
ABWE1	Amphibian Breeding Habitat (Wetland)	WR – 114 AR – 77 TC – 118	Within 120 m	Yes	Yes
ABWE2	Amphibian Breeding Habitat (Wetland)	UL - 3	Within 120 m	Yes	Yes
Habitat for Species of Conservation Concern					
MBB1	Marsh Breeding Bird Habitat	WT-115 AR-78 TC - 119	Within 120 m	Yes	Yes
ABB1	Woodland Area-Sensitive Breeding Bird Habitat	WT – 48 UL – 3 AR – 3 TC – 23	Within 120 m	Yes	Yes
OCB-1	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
OCB-2	Open	WT – overlapping	In	Yes	Yes

Table 4.8: Summary of Evaluation of Significance of Natural Features

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Located in or within 120 m of Project Location	Significant? (Y/N)	Carried Forward to EIS (Y/N)
	Country Bird Breeding Habitat	AR – overlapping UL – overlapping TC – overlapping BU – overlapping			
OCB-3	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
OCB-4	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-5	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
OCB-6	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-7	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-8	Open Country Bird Breeding Habitat	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-9	Open Country Bird Breeding Habitat	UL – 4 AR – 8	Within 120 m	Yes	Yes
SSB1	Shrub/Early Successional Bird Breeding Habitat	UL – 20 AR – 16	Within 120 m	Yes	Yes
SSB3	Shrub/Early Successional Bird Breeding Habitat	UL – 94 AR – 90 TC – 98	Within 120 m	Yes	Yes
SSB4	Shrub/Early Successional Bird Breeding Habitat	WT – 65 UL – 70 AR – 66 TC - 65	Within 120 m	Yes	Yes
SSB5	Shrub/Early Successional Bird Breeding	WT – 35 UL – 90 AR – 101	Within 120 m	Yes	Yes

Table 4.8: Summary of Evaluation of Significance of Natural Features

Feature ID	Feature Type	Distance to Project Infrastructure Within 120 m (m)	Located in or within 120 m of Project Location	Significant? (Y/N)	Carried Forward to EIS (Y/N)
	Habitat	TC – 34			
OCB-1	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
OCB-2	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-3	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
OCB-4	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-5	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping	In	Yes	Yes
OCB-6	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-7	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-8	Short-eared Owl	WT – overlapping AR – overlapping UL – overlapping TC – overlapping BU – overlapping	In	Yes	Yes
OCB-9	Short-eared Owl	UL-4 AR-8	Within 120 m	Yes	Yes
Generalized Significant Wildlife Habitats					
SN1	Snake Hibernacula	Not in or within 120 m of infrastructure identified in Appendix D of the NHA guide that will have an operational impact on the habitats. Therefore these habitats will be carried forward to the Environmental Impact Study where they will be treated as significant and general construction mitigation will be applied.		Treated as Significant	Yes

Legend: WT: Wind Turbine; UL: Underground Transmission Line; AR: Access Road, OL: Overhead Transmission Line, TC: Temporary Construction Areas, BU: Building/Substation
* This feature has not yet been evaluated. It will be evaluated prior to construction.

The locations of the significant features are presented in **Figures 5.1-5.5, Appendix A**.

An Environmental Impact Study Report will be prepared to identify mitigation measures in respect to any negative environmental effects on these features.

5.0 Environmental Impact Study

The construction, installation or expansion of a renewable energy generation facility is not permitted within a provincially significant southern wetland, provincially significant coastal wetland, or a provincial park or conservation reserve (unless otherwise permitted under the Provincial Parks and Conservation Reserves Act, 2006) (O. Reg. 359/09, s. 37).

Such facilities may be permitted within the following areas subject to the completion of an EIS (O. Reg. 359/09, s. (38(1)):

- provincially significant northern wetland;
- provincially significant life science ANSI;
- significant valleyland;
- significant woodland;
- significant wildlife habitat;
- within 120 m of the above natural features, provincially significant southern wetland, provincially significant coastal wetland, provincial park or conservation reserve; or
- within 50 m of a provincially significant earth science ANSI (O. Reg. 359/09, s. (38(1)).

In accordance with O. Reg. 359/09, s. 37, no part of the Amherst Island Project is sited within a provincially significant southern or coastal wetland (as a condition of the application of the Wetland Characteristics and Ecological Functions Assessment protocol (MNR 2011a)). Furthermore, since the Project Location includes the air space in which a Project operates, the wind turbines have been sited such that no part of a turbine blade overhangs a provincially significant southern or coastal wetland.

Significant natural heritage features that occur in or within 120 m of the Amherst Island Project Location are summarized in Table 4.7 and include Project components:

- within 120 m of significant wetlands;
- in and within 120 m of non-significant wetlands;
- in and within 120 m of significant woodlands;
- in and within 120 m of significant wildlife habitat components;
- and within 50 m of a Provincially Significant Life Science ANSI.

In accordance with O. Reg 359/09, an EIS must be prepared to identify and assess potential environmental effects and identify mitigation measures designed to prevent or minimize potential effects on a natural feature. Natural features within the Amherst Island Study Area, for which an EIS is required, include significant wetlands, significant woodlands, significant wildlife

habitat and an ANSI. Direct impacts on wildlife (i.e. mortality) are addressed through the Environmental Effects Monitoring Plan (EEMP) which is provided in the Design and Operations Report. A summary of the EEMP can be found below in **Section 5.6**.

5.1 PROJECT FOOTPRINT OVERVIEW

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 10-15 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 10-15 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 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. All proposed crane paths will follow collector line corridors, with a constructible area of approximately 10 m wide.

Underground and/or overhead 34.5 kV collector lines (underground 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 15 m x 73 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.

The Project Location (including constructible area) and the associated 120 m Zone of Investigation, in relation to significant natural features, are shown on **Figure 5.1-5.5, Appendix A**.

The Draft Construction Plan Report for the Amherst Island Wind Energy Project (2012b) will detail the full construction specifications. Construction activities area anticipated to be ongoing for 18-24 months from the start of construction. The projected timing and duration of key construction activities is provided in **Table 11B, Appendix B**.

5.2 LAND USE OF PROJECT LOCATION

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.

All of the 36 turbines are sited within lands currently managed for agriculture (hay or pasture). The total amount of natural vegetation to be removed permanently for the duration of Project operation (i.e. long term removal areas) is 15.0 ha. An additional 40.5 ha of vegetation 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 entire municipal road allowance (on

both sides of the road) for roadside collector lines, and considers the potential for underground collector lines. Detailed design undertaken in consultation with the County will determine on which side of the road allowance the collector lines will be located. Therefore the assumption of disturbance of the entire road allowance is considered conservative in terms of area and magnitude of impact.

Vegetation to be removed or disturbed for the Project consists primarily of deciduous woodland and agricultural land. Details on habitat removal by vegetation community type is provided in **Table 12B, Appendix B**. Details on habitat to be removed by natural feature type is provided in **Table 13B, Appendix B**.

5.3 NEGATIVE ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES ASSOCIATED WITH THE CONSTRUCTION AND DECOMMISSIONING PHASES OF THE PROJECT

The primary mitigation measure employed to reduce impacts to natural features and functions was avoidance; micro-siting decisions made during the development of the Project layout considered minimizing impacts to natural features and wildlife habitat. The Project is sited predominately within actively agricultural land with minimal natural habitat removal required for the Project. Modifications to the site plan were made to avoid placing the Project is significant features.

Large provincially significant coastal wetlands with open aquatic habitat are located in the southwestern portion of Amherst Island, the boundaries of which were re-delineated and expanded during the Evaluation of Significance. As a result of the re-delineation, turbines were removed and access roads relocated. Outside of these coastal wetlands, most wetlands within the Study Area consisted of early successional habitats; meadows regenerating in reed canary grass or early successional woodlands of green ash. To the extent possible, the project was sited outside of these features, with the exception of a small amount (0.143 ha temporarily and 0.087 ha permanently) of reed canary grass meadow marsh removal for access roads and collector lines.

The Project Location has been sited to avoid woodlands within the Study Area to the extent possible. Modifications to the layout has resulted in only a minimal amount of proposed tree removal within a single woodland for an access road and collector line, where avoidance was not possible due to access constraints. Proposed turbines locations are set back from significant woodlands. Most turbines are sited more than 50 m from significant woodlands, with the exception of three turbines sited 11 m, 47 m and 48 m from the dripline of significant woodlands.

Impacts to shoreline and offshore habitat have been avoided. All proposed turbine locations are sited more than 550 m from the shoreline.

Removal of relatively small amounts of hay and pasture habitat was unavoidable while siting the project, given the abundance of these habitat type on Amherst Island. However, overall the amount of grassland habitat removal is a small proportion of grassland available within the Study Area. Grasslands (including pasture and hayfields) provide habitat for open country breeding birds and wintering raptors, in particular the Short-eared Owl. In order to minimize impact on the habitat for these species, collector lines and access roads were made as short and as direct as possible to connect to the turbines. The width of access roads post-construction will as also be minimized to 4-6 m to reduce habitat loss, and construction areas will be re-seeded immediately with hay or grass, in consultation with the landowners.

The initial layout design evaluation was a table top exercise by the consultants to examine all natural resource data (provincial and local government, stakeholder information and preliminary site investigations (Golder Associates 2007 and Stantec 2011), as well incorporating the REA regulatory setback constraints. The information gathered allowed the subject matter experts to identify key habitat areas of interest. In addition to natural resource information, the social and cultural aspects issues for the island were also considered for the project design were also significant large parameters components in the development of the initial project and layout. Existing land activity was also taken into consideration: Current farming activity, including a large cattle grazing operation on pastureland, was considered in turbine placement in order to reduce the impact on the highest quality grassland habitat available.

The Evaluation of Significance surveys, including surveys for grassland breeding birds and wintering raptors, were conducted in 2011. Information gathered through these surveys informed the design engineers of the locations of important areas for open country birds. This information, in conjunction with the social and cultural concerns, including private landowner input, allowed the proponent to develop the most appropriate project layout. This included moving and removing proposed turbine locations, minimizing access road widths and lengths, and using underground cabling where possible.

5.3.1 Significant Woodlands

Fifteen of the woodlands met the criteria for significance based on criteria standards within the NHA Guide for Renewable Energy Projects. Potential negative impacts and proposed mitigation measure during the construction and decommissioning phases of the Project are detailed in **Table 14B, Appendix B**.

The primary mitigation strategy was avoidance of the significant woodlands. The 15 significant woodlands located in or within 120 m of the Project Location are shown on **Figures 5.1-5.5, Appendix A**.

The Project Location is proposed to occur within three significant woodlands: Woodlands 4, 9, and 36. Woodland 4 (**Figure 5.2, Appendix A**) is a 214.7 ha woodland that was determined to be significant based on six of the seven criteria: woodland size, interior habitat, proximity of other features, linkages, water protection and woodland diversity. It is comprised of a mosaic of

deciduous forest, deciduous swamp and thicket habitat. It also provides significant wildlife habitat for migratory landbird stopover, area-sensitive bird breeding habitat, old growth forest and amphibian breeding. An underground collector line is proposed to run through a section of this feature. The collector line will follow an existing farm trail, approximately 6 m wide, and through the feature with no tree removal proposed. Overall, potential impacts to Woodland Feature 4 are anticipated to be very minor.

Woodland Feature 9 (**Figure 5.4, Appendix A**) is a 15.8 ha woodland that was determined to be significant based on three of the seven criteria: woodland size, interior habitat, and woodland diversity. It is composed of three habitat types: Fresh-Moist Oak-Maple-Hickory Deciduous Forest, Fresh-Moist Shagbark Hickory Deciduous forest, and Gray Dogwood Cultural Thicket. It does not contain any significant wildlife habitat. An access road and underground cabling are proposed to cross through a narrow section of the Shagbark Hickory Deciduous Forest community, resulting in the removal of 0.099 ha temporarily and 0.06 ha permanently of woodland. Removal of vegetation within this feature for construction of Project components could have the potential to affect both flora and fauna through loss of species diversity, by reducing or fragmenting available habitat (especially for species with low mobility), from the introduction or spread of invasive species, and from the temporary disruption to movement of wildlife.

Woodland Feature 36 (**Figure 5.3, Appendix A**) is a 306.9 ha woodland that was determined to be significant based on five of the seven criteria: woodland size, interior habitat, linkages, water protection and woodland diversity. It is composed of Fresh-Moist Ash Lowland Deciduous Forest, and it does not contain any significant wildlife habitat. A temporary laydown area and buildings are proposed to overlap with a portion of a hedgerow associated with this woodland, resulting in the removal of 0.181 ha temporarily of woodland. Removal of vegetation within this feature for construction of Project components could have the potential to affect both flora and fauna through loss of species diversity, by reducing available habitat (especially for species with low mobility), from the introduction or spread of invasive species, and from the temporary disruption to movement of wildlife.

Indirect impacts to significant woodlands resulting from construction activities, such as dust generation, sedimentation and erosion are expected to be short term, temporary in duration and mitigable through the use of standard site control measures. Potential impacts and mitigation requirements to significant woodlands are described in **Table 14B, Appendix B** as well as in the general construction mitigation recommendations in **Table 5.1** below.

5.3.2 Significant Wetlands

Twenty wetlands, not previously identified by MNR, were identified in or within 120 m of the Project Location and are treated as provincially significant, with the exception of Wetlands 6 and 7. Both the Nut Island Duck Club Marsh (Wetland 10a) and Long Point Marsh (Wetland 21),

previously identified as provincially significant by the MNR, remain as provincially significant in this report.

The primary mitigation strategy was avoidance of wetlands. Prior to final siting of the Project, significant wetlands were identified applying a conservative approach. Substantial effort was allocated to the design of the final layout to ensure that Project components were sited outside of conservatively identified significant wetland boundaries. Separation distances from Project components to significant wetlands were maximized to the extent possible as an impact avoidance strategy. The 20 significant wetlands located within 120 m of the Project Location are shown on **Figures 5.1-5.5, Appendix A**.

There will be no direct loss of significant wetland habitat or function due to the Project. Indirect impacts resulting from construction activities, such as dust generation, sedimentation, and erosion are expected to be short term, temporary in duration and mitigable through the use of standard site control measures.

New access roads and infrastructure can alter surface flow, and the minimal increase in hard surface area could result in increased run-off quantities during precipitation events. Access roads at their permanent width of 6 m will cover approximately 20.7 ha in total over the entire study area. The percent area converted to hard surfaces is negligible and no effect to the water balance is anticipated. Potential impacts and mitigation measures for dewatering are provided in **Section 5.5**.

During construction, there will be increased vehicular traffic and the potential for accidental spills. These potential impacts will be avoided where possible and mitigated via implementation of a sediment and erosion protection plan, including the identification of specific locations for material stock-piling and maintenance activities to isolate any spills from the wetland. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately. Mitigation measures for stock-piling, maintenance, and potential spills are provided in **Section 5.5**.

Vegetation clearing and construction disturbance in close proximity to wetland features may create new edges in adjacent communities. Such edges may cause changes in vegetation composition as result of increased exposure to sun and wind, particularly in closed canopy situations. This can create opportunities for the introduction and spread of invasive species in nearby wetland units.

Potential negative impacts and proposed mitigation measures during the construction and decommissioning phases of the Project are detailed in **Table 14B, Appendix B**. Mitigation measures to be applied to each wetland feature are provided in **Table 15B, Appendix B**.

5.3.2.1 Non-Provincially Significant Wetlands

Wetlands 6 and 7 were evaluated using OWES and were determined not to be provincially significant (see Sections 4.1.1 and 4.2.1). These non-provincially significant wetlands consist of a concentration of reed canary grass, occurring in moist depressions in fields. These non-provincially significant wetlands do not require an EIS; regardless, the relatively small amount of removal of reed canary grass is not anticipated to have an impact on local vegetation or the ecological function of wetland habitat for wildlife. Results of the field surveys have found that ground roosting Short-eared Owls are often found in areas of reed canary grass. Potential impacts to ground roosting raptors are discussed further **Section 5.3.3.2**.

5.3.3 Significant Wildlife Habitats

The following significant wildlife habitats were identified in or within 120 m of the Project Location (**Table 4.7; Figures 5.1-5.5, Appendix A**):

- Raptor Wintering Area (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7, and RWA8)
- Turtle Overwintering Area (TO1)*
- Migratory Landbird Stopover Area (ML1, ML2, ML3, ML4 and ML5)
- Old Growth Forest (OGF1, OGF2, and OGF3)
- Amphibian Breeding (Woodland and Wetland) (ABWO2, ABWO3, ABWE1, ABWE2)
- Marsh Breeding Birds (MBB1)
- Woodland Area-Sensitive Breeding Bird Habitat (ABB1)
- Open Country Breeding Bird Habitat and Short-eared Owl Habitat (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8, and OCB9)
- Shrub/Early Successional Bird Breeding Habitat (SSB1, SSB3, SSB4, SSB5)

*This habitat has not been evaluated and is being treated as significant in this report. It will be evaluated prior to construction.

Mitigation measures for each feature are provided in **Table 16B, Appendix B**.

5.3.3.1 Raptor Wintering Areas

Amherst Island contains abundant grassland habitat, predominantly hay and pasture, which provides significant habitat for wintering raptors, including owls. For the purpose of the NHA, the Study Area on the island has been divided into 8 large blocks of grassland and woodland (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7 and RWA8), each of which has been evaluated as significant habitat for raptor wintering areas (**Figures 4.1-4.5, Appendix A**). The extent of grassland habitat, the high meadow vole population and the windswept nature of Amherst Island, which helps to reduce snow cover, provide significant habitat for winter raptors.

The raptor wintering areas mostly consist of hay and pasture fields, with woodlands that provide roosting opportunities. Most of the woodlands on the island consist of deciduous trees, which may be used by roosting American Kestrel and Red-tailed and Rough-legged Hawks. Coniferous dominated woodlands occur in the northwestern portion of the island, and in and around the Owl Woods in the eastern portion of the island. These coniferous woodlands are used as roosting areas by Long-eared Owls, Northern Saw-whet Owls and, to a lesser extent, Boreal Owls. Snowy Owl will not necessarily use the woodlands for roosting, often utilizing posts, hay bales, hedgerows, etc. Some species, such as Northern Harriers and Short-eared Owls will roost in open fields. The grassland habitat on the island provides hunting opportunities for all of these species.

As the majority of the island is comprised of grassland habitat, avoidance of this habitat type was not possible; most Project components are sited in significant raptor wintering areas. As a result, construction will result in direct loss of habitat, although this amount represents a relatively small amount of significant open country habitat in the Study Area. In total, approximately 68.6 ha of significant raptor wintering area habitat will be temporarily removed and approximately 17.7 ha of significant raptor wintering area habitat will be removed for the life of the project; this respectively represents 1.8% and 0.5% of the total identified significant raptor wintering habitat of 3742 ha. During the field studies for the Evaluation of Significance, several roost locations for Short-eared Owls were identified in the open grassland. Roost sites generally were comprised of grassy areas with dense residual dead vegetation, in particular areas dominated by reed canary grass. Results suggest that Short-eared Owls generally move between roosts or within a larger roost site; no specific roost locations were found to be used consistently throughout the winter of 2011/2012. Access roads and underground collect lines (on private land) are proposed to pass through some of the sites where Short-eared Owls were observed roosting, however, there will be limited removal of vegetation. Ground roosting sites for Short-eared Owls do not appear to be a limiting factor on Amherst Island. This small loss of habitat is anticipated to have a negligible impact on the availability of roost sites within the Study Area. In most cases, Short-eared Owls would be are expected to continue using sites adjacent to the access roads, as documented on other wind projects (i.e. Wolfe Island).

Potential indirect impacts to wintering raptors during construction, including disturbance due to increased traffic, noise, or dust, is likely to have a more significant impact than habitat loss. However, these disturbance impacts will be temporary and short term in duration.

The Owls Woods is a well-known roost location for wintering Long-eared Owls, Northern Saw-whet Owls and, to a lesser extent, Boreal Owls. The Project will have no encroachment into Owl Woods, with construction activities occurring approximately 500 m from the pine plantation within the woods, which supports the highest concentration of owls. Swengel (1987, in Sandilands 2010) found the Northern Saw-whet Owls were tolerant of moderate to heavy human activity, as long as they were not detected; suggesting activities in the fields outside of the Owl Woods are unlikely to result in significant disturbance. Overall, considering construction activities will be short term in duration and outside of the Owl Woods, construction of the Project

is not anticipated to have a significant impact on wintering raptors roosting within the Owl Woods.

Windlectric Inc. is committed to having discussions with landowners, potentially including Cataraqui Region Conservation Authority, to augment wintering owl habitat on Amherst Island. This would include development of a management strategy with agencies, interested landowners, and other interested parties to implement some of the recommendations provided in the Owl Woods Management Plan (Ecological Services 2011). Recommendations in the plan that could be implemented include, but are not limited to, improvement of infrastructure, signage and public education at the Owl Woods, as well as future planting of trees to increase roosting options on the island.

Potential negative impacts and proposed mitigation measures during the construction and decommissioning phases of the Project are detailed in **Table 14B, Appendix B**.

5.3.3.2 Turtle Overwintering Area

A single turtle overwintering area (TO1, **Figure 5.4, Appendix A**) has been identified. This feature has been assumed as significant, which will be confirmed prior to construction; see **Section 5.6.3.3** below.

TO1 occurs in the open water of the Long Point Marsh PSW. No Project components are sited within TO1. The closest project component is an access road, located approximately 77 m from TO1 and on the opposite side of an existing municipal road. As such there will be no encroachment or habitat loss.

During spring emergence, turtles seek out basking sites within, or in very close proximity to their overwintering area. It would be unlikely to encounter a turtle 77 m from the marsh during spring emergence. As such, direct impacts to wintering or spring-emerging turtles are very unlikely.

Potential indirect impacts to TO1 could include wetland degradation from dust, siltation or accidental spills. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately. These potential impacts and mitigation measures are covered under the discussion of significant wetlands in **Section 5.4.2**.

5.3.3.3 Migratory Landbird Stopover Area

Four significant migratory landbird stopover and staging areas have been identified within 120 m of the Project Location: ML1, ML2, ML3, ML4 and ML5 (**Figures 5.1-5.5, Appendix A**). No Project components are in this type of significant wildlife habitat.

ML1 (Woodland Feature 4) is approximately 215 ha in size, comprised of deciduous forest and swamp. It is located in the southwest portion of the island; the west end of ML1 is within 1 km of the shoreline (**Figure 5.4, Appendix A**).

ML2 (Woodland Feature 10) is approximately 29 ha in size, comprised of lowland deciduous forests. It is located centrally on the island, approximately 2.6 km from the southern shoreline and 3.2 km from the northern shoreline (**Figure 5.3, Appendix A**).

ML3 (Woodland Feature 15) is approximately 19.5 ha in size, comprised of lowland deciduous forest. It is located in the southwest portion of the island, immediately adjacent to the Long Point Marsh PSW. ML3 is located approximately 0.5 km from the southern shoreline (**Figure 5.5, Appendix A**).

ML4 (Woodland Feature 21) is approximately 198 ha in size, comprised of a mosaic of deciduous lowland forest and deciduous swamp. It occurs centrally within the island, approximately 1 km from the southern shoreline and 1.6 km from the northern shoreline (**Figure 5.3, Appendix A**).

ML5 (Woodland Feature 23) is approximately 18.3 ha in size, comprised of deciduous ash lowland forest, deciduous upland sugar maple forest, and dry jack pine coniferous forest. The coniferous forest is known as the Owl Woods. It occurs centrally within the island, approximately 1 km from the southern shoreline and 1.2 km from the northern shoreline (**Figure 5.3, Appendix A**).

No project components are sited within significant migratory landbird stopover areas. Project components located within 120 m of each feature are summarized in **Table 4.7**. No direct impacts to migratory landbird stopover areas are anticipated from construction of the project, as no encroachment into, or removal of, this habitat type is proposed.

Potential indirect impacts to migratory landbirds from the Project during construction include disturbance due to increased traffic, noise, or dust. The most adverse impacts associated with construction noise typically occur if critical life cycle activities are disrupted (i.e. nesting, mating) (NWCC 2002). Because migrating landbirds in general are able to use a much wider range of habitat types during migration compared to the breeding season, it is expected that the effects of disturbance would be less significant during migration than during the breeding season.

Potential negative impacts and proposed mitigation measures during the construction and decommissioning phases of the project are detailed in **Table 14B, Appendix B**.

5.3.3.4 Old Growth Forest

Three significant old growth forests have been identified within 120 m of the Project Location: OGF1, OGF2, and OGF3 (**Figures 5.4, Appendix A**). No Project components are in this type of significant wildlife habitat.

No project components are sited within significant old growth forest. Project components located within 120 m of each feature are summarized in Table 4.7. Setbacks from each of the old growth forest units to the closest project component are between 8 m and 71 m from blade tip. No direct impacts to old growth forest habitat are anticipated from construction of the project, as no encroachment into, or removal of, this habitat type is proposed. Potential indirect effects include woodland degradation from dust or siltation. These potential impacts and mitigation measures are summarized in **Table 14B, Appendix B**.

5.3.3.5 Amphibian Breeding (Woodland and Wetland)

Three significant amphibian breeding areas have been identified within 120 m of the Project Location: ABWO2, ABWO3, ABWE1 and ABWE2 (**Figures 5.1-5.5, Appendix A**). No Project components are in this type of significant wildlife habitat.

ABWO2 consists of deciduous swamp within the Nut Island Duck Club Marsh PSW. The Project Location is sited outside of this feature; the closest project component is an access road, approximately 54 m away (Figure 5.4).

ABWO3 consists of meadow marsh on the mainland. The Project Location is sited outside of this feature; the closest project component is a temporary construction area, approximately 29 m away.

ABWE1 consists of deciduous woodland and open marsh within the Long Point Marsh PSW. The Project Location is sited outside of this feature; the closest project component is an access road, approximately 77 m away (Figure 5.4).

ABWE2 consists of reed canary grass marsh along a watercourse, upstream of the Long Point Marsh PSW. The Project Location is sited outside of this feature; the closest project component is an underground collector line, approximately 3 m away, within the municipal RoW (Figure 5.5).

No loss of amphibian breeding habitat is anticipated from the project. The type of construction proposed involves works having little or minimal impact to pervious areas and precludes the potential for effects associated with changes in water influence (i.e. surface and water changes).

Construction activities are expected to be low impact and short term in duration. Potential impacts to amphibian habitat could include wetland degradation from dust, siltation, erosion or accidental spills. In the event of an accidental spill, the MOE Spills Action Centre will be

contacted and emergency spill procedures implemented immediately. These potential impacts and mitigation measures are covered under the discussion of significant wetlands in **Section 5.4.2**.

At ABWE2 an underground collector line will be installed within 3 m of the amphibian breeding habitat. All work will be completed in the roadway or the municipal road allowance. At this location, the boundaries of the amphibian breeding habitat should be delineated and flagged / staked in the field by a qualified ecologist. Erosion and siltation controls will be installed.

These potential impacts and mitigation measures are summarized in **Table 14B, Appendix B**.

5.3.3.6 Marsh Breeding Bird Habitat

A single significant woodland marsh breeding bird habitat was identified within 120 m of the Project Location: MBB1 (**Figure 5.5, Appendix A**).

MBB1 (Wetland 21) is approximately 350 ha in size with a variety of wetland habitats including shallow marsh. No project components are proposed to overlap with this habitat. Project components within 120 m of this habitat feature are a wind turbine located 115 m, temporary construction area located at 119 m, and an access road located at 78 m from this feature.

There will be no direct loss of marsh breeding bird habitat. Indirect impacts during construction could include disturbance or disruption to breeding birds. Disturbance from construction activities, such as increased traffic, noise, or dust, may result in avoidance of habitats by birds. These effects may be greatest if disturbance occurs during critical life stages such as courtship or nesting (NWCC 2002).

Potential impacts and mitigation measures are summarized in **Table 14B, Appendix B**.

5.3.3.7 Woodland Area-Sensitive Breeding Bird Habitat

A single significant woodland area-sensitive breeding bird habitat was identified in and within 120 m of the Project Location: ABB1 (**Figure 5.4, Appendix A**).

ABB1 (Woodland 4) is approximately 215 ha in size with >4 ha of interior forest habitat and is comprised of deciduous forest and swamp. An underground collector line is proposed to cross through ABB1; however, it will be installed within an existing farm trail, so no tree removal is proposed. An access road is proposed within 3 m of the edge of a relatively small portion of the feature. Five turbines occur within 120 m of ABB1, the closest of which is 48 m away from turbine blade sweep.

There will be no direct loss of woodland area-sensitive breeding bird habitat. Indirect impacts during construction could include disturbance or disruption to breeding birds. Disturbance from construction activities, such as increased traffic, noise, or dust, may result in avoidance of

adjacent habitats by birds. These effects may be greatest if disturbance occurs during critical life stages such as courtship or nesting (NWCC 2002).

Potential impacts and mitigation measures are summarized in **Table 14B, Appendix B**.

5.3.3.8 Open Country Breeding Bird Habitat and Short-eared Owl Habitat

Amherst Island contains abundant grassland habitat, predominantly hay and pasture. For the purpose of the NHA, the Study Area on the island has been divided into 9 large grassland blocks (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8 and OCB9), each of which has been evaluated as significant habitat for open country breeding birds and Short-eared Owl breeding habitat.

As the majority of the island is comprised of grassland habitat, avoidance of this habitat type was not possible; most project components are sited in the significant open country breeding bird habitat and Short-eared Owl breeding habitat. As such, construction will result in direct loss of a relatively small amount of habitat. In total, approximately 67.8 ha of open country breeding bird habitat will be temporarily removed and approximately 17.2 ha of open country breeding bird habitat will be removed for the life of the project; this respectively represents 2.1% and 0.6% of the total identified significant open country habitat of 3113 ha. The implementation of mitigation measures such as avoiding activities that could disturb or destroy nests during key periods or protecting active nests with buffer zones reduces potential impacts to nests.

Fragmentation of the grassland habitat is a potential impact from the installation of the Project. The Study Area generally provides contiguous grassland habitat, with some breaks created by woodlands or field in cultivation (e.g. corn, wheat, soya). Given the contiguous nature of the grassland habitat within the Study Area, the majority of the habitat is suitable for area sensitive species. Construction of the project will result in removal of a very minimal amount of the grassland habitat, predominately in long, linear strip for the access roads. The access roads, at 4-6 m in width, are not likely to create a significant break in the grassland habitat, resulting in fragmentation. As such, the Project is unlikely to impact the suitability of the grassland habitat for area sensitive species. There are four of the open country habitats with contain proposed access roads that cross entirely through the habitat, potentially creating smaller contiguous habitat patches. None of these created habitat patches are less than 30 ha, which is the minimum patch size required for open country breeding birds as described in the Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (MNR 2012). However, the creation of roads has the potential to increase the edge habitat that may increase nest parasitism and predation, changes in food availability and habitat characteristics, and an increase in vehicle traffic and human disturbance (Northern EnviroSearch Ltd., 2008). Several studies of avoidance to roads by grassland breeding birds are available; generally, the level of disturbance has been associated with road traffic volume and subsequently noise (U.S. Department of Transportation 2004, Reijnen et al., 1987). Forman et al., 2002 found that increasing traffic was related to increasing avoidance from grassland birds, with no significant effect observed on roads with

traffic volume of 3000-8000 vehicles/day or less. Traffic along proposed access roads during operation of the project is likely to be in the range of a few vehicles a week and therefore is not likely to result in a significant avoidance effect.

To address any possible fragmentation effects of building access roads in this grassland habitat and an increase in traffic, the following measures will be implemented during operation or after decommissioning:

- Minimize maintenance vehicle traffic and human presence on access roads during grassland breeding bird season (May 1st to July 31st)
- Rehabilitation of access roads back to grassland after decommissioning, in consultation with the landowners

The placement of the access roads was considered with respect to REA setback requirements and existing activity on private properties. For example, existing public infrastructure was used where possible to limit the installation of an access road, access roads were placed along fence or tree lines to avoid removing vegetation in significant woodlands as well as not disrupting interior grassland habitat, and surface water considerations were used when placing roads and culverts in order to reduce surface water run-off into significant habitat areas. Other constraints factored into the placement of roads as well such as regulatory constraints on unopened road allowances, landowner consultation, significant wetlands, and cost.

Construction activities have the potential to result in disturbance or disruption to breeding birds. Disturbance from construction activity, such as increased traffic, noise, or dust, may result in avoidance of habitats by birds. These effects may be greatest if disturbance occurs during critical life stages such as courtship or nesting (NWCC 2002).

Grassland raptors, such as Northern Harrier or Short-eared Owl, may be more vulnerable to disturbance effects during construction. Females disturbed at the early stages of nest building have been reported to abandon the site and nest a short distance away. However, Sandilands (2010) reported that human disturbance is not likely to be a major factor for nesting Short-eared Owls.

Mitigation will include identification of Short-eared Owl breeding territories and curtailment of construction activities within the breeding territories from mid-March through to end of July. Curtailment would include avoidance of the use of heavy equipment in a potential breeding territory during the early nesting stage, from mid-March through end of May. Following this period, nesting Short-eared Owls are likely to be less susceptible to disturbance. However, construction activities will be avoided at dawn and dusk, to mitigate potential avoidance impacts to hunting owls.

Wiggins et al. (2006) reports that nests from previous years may occasionally be reused. However, Short-eared Owl research on Amherst Island in 2009 and 2010 (Keyes 2011) found low site fidelity between years. As such, breeding territories from previous years may not be a

good indicator of territory location during construction. Therefore, a qualified biologist will conduct targeted Short-eared Owl surveys in proximity to project components to identify potential nesting territories. Where territories have been identified in the same year as construction, weekly monitoring will be undertaken to measure potential avoidance behavior by Short-eared Owls, with weekly reports of the findings to MNR. If deemed necessary, additional adaptive management will be implemented in consultation with MNR.

Potential impacts and mitigation measures are summarized in **Table 14B, Appendix B**.

5.3.3.9 Shrub/Early Successional Bird Breeding Habitat

Four significant shrub/early successional breeding bird habitat features were identified within 120 m of the Project Location: SSB1, SSB3, SSB4 and SSB5 (**Figures 5.1-5.5, Appendix A**). No Project components are in this type of significant wildlife habitat.

SSB1 consists of approximately 14 ha of green ash cultural woodlands and is contained within Woodland Feature 3. The Project Location is not sited within this feature. The closest project component is an access road 16 m away. The access road is situated on the other side of an existing municipal road. No turbines are located within 120 m of the feature.

SSB3 consists of approximately 12 ha of grey dogwood cultural thicket. It is located adjacent to Woodland Feature 23 and is part of Owl Woods. The Project Location is not sited within this feature. The closest project component is an access road 90 m away. No turbines are located within 120 m of the feature.

SSB4 consists of approximately 74.8 ha of grey dogwood cultural thicket and is not associated with a woodland feature. The Project Location is not sited within this feature. The closest project component is a wind turbine blade tip, 65 m away.

SSB5 consists of approximately 35.7 ha of grey dogwood cultural thicket interspersed with Fresh-Moist Ash Lowland Deciduous Forest and is contained within Woodland Feature 21. The Project Location is not sited within this feature. The closest project component is a temporary construction area, 34 m away. A wind turbine is proposed for 35 m away. There will be no direct loss of habitat or function to the significant shrub/successional breeding bird features. Indirect impacts during construction could include disturbance or disruption to breeding birds. Disturbance from construction activities, such as increased traffic, noise, or dust, may result in avoidance of habitats by birds. These effects may be greatest if disturbance occurs during critical life stages such as courtship or nesting (NWCC 2002).

Potential impacts and mitigation measures are summarized in **Table 14B, Appendix B**.

5.3.4 Generalized Significant Wildlife Habitats

In addition to the series of wildlife habitats identified above, a number of wildlife habitat types have also identified that may be present within the Study Area, but are located in or within 120 m of Project components that are not expected to have an operational impact on this habitat. It includes Snake Hibernacula (SN1). In accordance with the NHA Guide (MNR 2011a), potential impacts to these habitats are typically associated with the temporary disturbance of construction activity and can be grouped together as generalized impacts and mitigation measures.

The full suite of wildlife habitats that require generalized consideration have been reviewed, and have compiled a comprehensive list of general construction mitigation measures that will be implemented during the construction and decommissioning phases (**Table 18B, Appendix B**) of the Project.

5.3.5 Areas of Natural and Scientific Interest (ANSI)

The Amherst Bay Life Science ANSI is located within 120 m of the Project Location. Because it is formed by the Long Point Coastal Marsh PSW, the impacts and associate mitigation are the same for these features. See **Section 5.3.2**.

5.4 OTHER GENERAL CONSTRUCTION MITIGATION

To fully identify all mitigation measures that are recommended for this development, the following section provides best management practices and other measures intended to minimize or mitigate potential adverse impacts on adjacent significant natural features. These measures will be implemented, where required and reasonable, during the construction and decommissioning of the various turbines, access roads and collector lines.

5.4.1 Vegetation Removal

Natural features where habitat will be removed include grasslands, wetlands and scattered trees. Where vegetation removal is proposed, the following mitigation measures will be applied:

- 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 implemented 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 and grassland removal will be completed prior to, or after, the core nesting season for breeding birds (May 1 to July 31). Should clearing be required during the breeding bird season, prior to construction, surveys will be

undertaken by a qualified biologist 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 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 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.

5.4.2 Sediment and Erosion Control Measures

In order to minimize erosion and the introduction of sediment into significant natural features during grading and construction activities, erosion and sediment (E&S) control measures will be implemented prior to the initiation of any construction.

The proximity of adjacent significant natural features increases the risk of sedimentation within a construction area. As such, all significant natural features identified within 30 m of any proposed construction area are at higher risk of sediment transfer and erosion from grading and topsoil removal.

E&S control measures will be in installed to minimize erosion impacts adjacent to significant natural features, as appropriate. The following measures/guidelines will be implemented, as required, during the construction of the Amherst Island Wind Project components:

- 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.

Specific E&S control measures will be selected, located and sized by an engineer during the detailed design stage to ensure proper functioning of these measures. All E&S controls will be installed prior to construction and will be maintained during and following construction to ensure their effectiveness at protecting the adjacent significant natural features.

5.4.3 Dewatering

Site specific geotechnical investigations to be completed prior to construction activities will provide further details related to geologic conditions. Dewatering requirements will be re-assessed as part of the geotechnical investigations.

If groundwater is encountered during excavations, good construction practices will be used, such as minimizing the length of time that the excavation is open and monitoring seepage into the excavation. Should pumping be required to dewater excavated areas, water will be directed into the nearest drain or spread across the buildable area and appropriate energy dissipation techniques will be used to reduce the potential for erosion and scouring. Discharge piping will be free of leaks and will be properly anchored to prevent bouncing and snaking during surging. The rate of discharge will be monitored to ensure no erosion or flooding occurs. If energy dissipation measures are found to be inadequate, the rate of dewatering will be reduced or ceased until satisfactory mitigation measures are in place.

In order to mitigate any impacts to significant natural features during dewatering activities, the following measures will be implemented, as required and necessary:

- The area to be used for dewatering will be clearly marked with flagging and/or snow-fencing prior to work commencing;
- During site preparation, silt fencing will be included to retain sediments on site so they do not enter any significant natural feature. All sediment control structures will be inspected regularly, and repaired/maintained as necessary;
- All water pumped during dewatering activities will be directed away from significant natural features and not directly into wetlands;
- The use of sediments bags (or filter rings) will be used as appropriate to filter out suspended sediment prior to discharge. Any sediment bags or filter rings will be monitored during pumping to ensure their efficacy, with any clogging or failures to be rectified immediately; and
- After the staging area and dewatering work area is no longer required, any remaining disturbed soils will be returned to pre-disturbance conditions and/or reseeded.

Further dewatering recommendations will be reviewed upon the completion of the detailed engineering design. Additional detail is provided in the Amherst Island Construction Plan Report (separate cover, Stantec 2012b).

5.4.4 Other General Mitigation Measures

Table 5.1 summarizes the general mitigation measures which will be implemented during construction, including the mitigation objective and specific location where each mitigation measure should be applied.

Table 5.1: Summary of Construction Phase Mitigation Measures Recommended

Mitigation Measure	Objective(s)	Location(s)
Any vegetation removal required along roadside collector lines should be minimized, and occur entirely within the road right-of-way.	Minimize vegetation removal and impacts on wildlife habitats	Underground Collector Lines/ or overhead collector lines
Any accidentally damaged trees should be pruned through the implementation of proper arboricultural techniques.	Protect tree species from permanent damage	Entire Project
Suspend work if high runoff volume is noted or excessive sediment discharge occurs.	Minimize erosion impacts on features when construction activities are proposed within 30 m of significant natural features	Within 30 m of any significant feature, including significant woodlands and wetlands and significant wildlife habitat*
No vehicle traffic on exposed soils, and no heavy machinery traffic on slopes	Limit unnecessary risk of increased erosion, turbidity or sedimentation	Entire Project
Re-vegetate temporary access roads or crane paths to pre-construction conditions as soon as possible.	Limit the potential for erosion or sedimentation due to exposed soil conditions	Entire Project
Maintain existing vegetation buffers around water bodies	Minimize the potential for erosion, and protect wildlife habitat, within riparian areas	Entire Project
Any stockpiled material will be stored more than 30 m from a significant wetland, woodland, or water body	Limit the potential for increased erosion within 30 m of significant natural features	Entire Project
All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30 m from any significant feature.	Minimize the risk of contamination of chemical spill around significant natural features	Entire Project
Develop a spill response plan, train staff on appropriate procedures, and keep emergency spill kits on site.	Minimize potential long-term effects or significant contaminations in the event an accidental spill occurs	Entire Project
Dispose of waste material by authorized and approved offsite vendors	Limit the potential for contamination of significant natural features	Entire Project
Implement infiltration techniques to the maximum extent possible.	Minimize potential impacts to soil moisture regime and groundwater stores	Entire Project
Design roads to promote infiltration.	Minimize potential impacts to soil moisture regime and groundwater stores	Entire Project
No herbicides will be used within significant features or wildlife habitats.	Avoid impacts to natural vegetation species, significant features, and wildlife habitats	Significant woodlands and wetlands, and significant wildlife habitat*
Minimize grading activities to maintain	Maintain existing surface water	Entire Project

Table 5.1: Summary of Construction Phase Mitigation Measures Recommended

Mitigation Measure	Objective(s)	Location(s)
existing drainage patterns, to the fullest extent possible.	drainage patterns	
Control rate and timing of water pumping, and restrict taking of water during periods of extreme low flow.	Limit potential impacts on water temperature, surface water storage, and wildlife habitat	Entire Project
Implementation of storm water discharge best management practices.	Avoid potential contamination of water sources	Entire Project
Collect drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal	Limit the potential for soil or water contamination	Horizontal Directional Drilling
Restore and re-vegetate entry/exit pits to pre-construction conditions as soon as possible after construction	Minimize the presence of exposed soil to reduce the potential for erosion	Horizontal Directional Drilling

** Only if these habitats evaluated as significant in this report or are determined to be significant through pre-construction surveys described in **Section 5.6.3.3***

5.4.5 Eastern Milksnake Mitigation Measures

Due to the generalist nature of this species, it is possible to encounter this species in almost any habitat available on Amherst Island. Because of this, special mitigation measures are provided in **Table 5.2** below for this species.

Table 5.2: Mitigation Measures for Eastern Milksnake

Mitigation Measure	Objective(s)	Location(s)
In cultural meadows, clearly delineate work area using silt fencing or similar barrier	Minimize Eastern Milksnake movement into work areas	In cultural meadow areas
Provide those on site with descriptions and photos of Eastern Milksnakes	Increase awareness of those on site of this species	Entire Project
If an Eastern Milksnake is encountered, work in the area must stop until the animal leaves the area on its own accord	Minimize harm to Eastern Milksnakes encountered	Entire Project
All Eastern Milksnakes encountered must be recorded, with UTMs and photographs where possible, to be presented to the MNR Peterborough district	Provide data to the MNR regarding this species on Amherst Island	Entire Project

5.5 NEGATIVE ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES ASSOCIATED WITH THE OPERATIONAL PHASE OF THE PROJECT

5.5.1 Significant Woodlands

Operation of the Project is anticipated to have very limited impacts to significant woodlands.

During operation, infrequent day to day use of access roads and maintenance activities associated with the road may result in impacts to woodlands, due to dust, but such impacts are expected to be minimal. If required, dust suppression during operation of the Project could be considered.

There may be occasional impacts during maintenance of access roads or collector lines. If major maintenance activities are required in proximity to significant woodlands, mitigation measure for construction (**Table 14B, Appendix B**) should be implemented.

Other potential impacts that might occur during operation include spills and contamination to the woodland. Improper disposal of wastes (fluids, containers, cleaning materials) could also have a negative impact on the feature. Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.

5.5.2 Significant Wetlands

As with significant woodlands, operation of the Project is anticipated to have very limited impacts to significant wetlands. There are no Project components located in significant wetlands.

During operation, infrequent day to day use of access roads and maintenance activities associated with the road may result in impacts to wetlands, due to dust, but such impacts are expected to be very minimal. If required, dust suppression during operation of the Project could be considered.

There may be occasional impacts during maintenance of access roads or collector lines. If major maintenance activities are required in proximity to significant wetlands, mitigation measure for construction (**Table 14B, Appendix B**) should be implemented.

Other potential impacts that might occur during operation include spills and contamination to the wetlands. Improper disposal of wastes (fluids, containers, cleaning materials) could also have a negative impact on the feature. Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.

5.5.3 Significant Wildlife Habitat

5.5.3.1 Raptor Wintering Areas

Fragmentation and disturbance of habitat as a result of wind energy projects were identified as a potential indirect effect to wintering raptors (Kingsley and Whittam 2007). Noise levels during operation might also impact hunting raptors, in particular owl species which primarily hunt by sound. Potential results of these disturbances could range from behavioural changes, such as local avoidance of turbines, to abandonment of the wind power project area. Nevertheless, much of the data collected from wind power developments in Canada and elsewhere indicates that wind turbines have limited effects on raptor activity or abundance in the wind power area.

Madders and Whitfield (2006) examined raptor sensitivity to displacement by wind turbines based on data from 8 studies and personal communications with three researchers. They conclude that most raptor species have low sensitivity to displacement (ie. no evidence reported in studies), including six species observed at Amherst Island: Turkey Vulture, Red-tailed Hawk, Broad-winged Hawk, Sharp-shinned Hawk, American Kestrel, and Peregrine Falcon. Stewart et al. (2007) conducted a meta-analysis of the effect of wind turbines on bird abundance at 19 globally-distributed wind farms, and concluded that raptors (Falconiformes and Accipitriformes) demonstrated minimal declines in abundance relative to waterfowl and wading birds. Their study methods were unable to determine whether declines noted for any species were due to decline in population size or local avoidance of the wind turbines. A comparison of breeding bird diversity and abundance between a wind turbine area in Northeastern Wisconsin and a nearby reference area revealed a reduced abundance of open-county raptors in the turbine area (Howe et al. 2002), however the authors suggest that differences may be due to habitat differences between the two areas and statistical significance was not noted. Red-tailed hawks were the 28th most abundance bird species in the reference area, and the 25th most abundant species in the turbine area (Howe et al. 2002).

A study of breeding bird population effects in the UK demonstrated local avoidance of operating wind turbines by up to 500m for Buzzard (*Buteo buteo*) and 1,000 m for Hen Harrier (*Circus cyaneus*) relative to control areas (Pearce-Higgins et al 2009). In contrast, North American raptors do not typically demonstrate local avoidance of wind turbines. In the Altamont Pass Wind Resource Area, California, Red-tailed Hawks were frequently observed flying and foraging around active wind turbines in fall (31.5 sightings per observation session) and regularly in winter (9.8 sightings/session; Hoover and Morrison 2005). Red-tailed Hawks were also observed on more than 1,000 occasions within the one-year study period perching on operating turbines (Hoover and Morrison 2005). As the species is thought to primarily hunt from a perch, this result strongly suggests that active wind turbines do not deter the species from foraging. Wintering raptors were infrequently observed at the Buffalo Ridge Wind Resource Area, comprising less than 2% of all observations (Osborn et al. 1998), nevertheless both Red-tailed Hawks and American Kestrels were observed hunting near active wind turbines. More than half

of observed Kestrels flew within 15 m of wind turbines, whereas Red-tailed Hawks rarely flew within 30 m of turbines (Osborn et al. 1998).

Diurnal raptors at the Erie Shores Wind Farm were observed only during summer and fall (James 2008), however flight and foraging behaviour around active wind turbines can be assumed to correlate to flight and foraging behaviour of wintering raptors. The majority of raptor species flew regularly within 200 m of, but not less than 50 m from, active turbines. Sharp-shinned Hawks were the exception, with approximately 50% of individuals flying within 100 m of turbines. Both Cooper's Hawk and Red-tailed Hawk were observed actively hunting within 50 m of turbines.

The three years of post-construction disturbance monitoring of wintering raptors completed at the Wolfe Island Wind Plant provides good insight into potential disturbance impacts of the Amherst Island Wind Project. Both islands are similar in ecology and support large concentration of raptors during the winter months, including species such as Short-eared Owl. The post-construction studies have demonstrated that wintering raptors continue to use the Wolfe Island Wind Plant project area in high numbers (Stantec 2010b, 2011b and 2012a). The studies have found some localized avoidance around operational wind turbines; for example, Short-eared Owls have rarely been observed foraging within 200 m of turbines with spinning blades. However, the impact of localized avoidance does not appear to have limited the number of raptors supported by the project area. Short-eared Owls have been recorded in significantly higher numbers during post-construction surveys than during pre-construction surveys. Generally, the abundance of raptors on Wolfe Island is closely associated with the abundance of prey. Disturbance from wind turbines to relatively small amount of available habitat in which they forage does not appear to be impacting the prey base or the ability of raptors to find and capture this prey. Similar results would be expected on Amherst Island, with the Project Area continuing to support high concentrations of raptors during operation of the Project.

Potential disturbance to roosting raptors from operational wind turbines is less likely to be of concern than disturbance to foraging birds in active flight. Availability of deciduous woodlands for roosting American Kestrels, Red-tailed Hawks and Rough-legged Hawks is unlikely to be affected by the operation of the project. Wind turbines have been set back from areas of coniferous forest in the northwestern portion of the island and around the Owl Woods, which supports roosting Saw-whet Owls and Long-eared Owls.

The Owl Woods is a well-known birding attraction with established trials which attracts birders and photographers from across North America. Historically, the level of disturbance within the Owl Woods from visitors has been relatively high. However, regardless of this level of disturbance, use of the woods by roosting owls has remained very high. Swengel (1987, in Sandilands 2010) found the Northern Saw-whet Owls were tolerant of moderate to heavy human activity while roosting, as long as they were not detected; detection may result in changing roosts. Often disturbance to roosting raptors comes from sudden disruptions that startle the birds (e.g. sudden noises or movement), or as Swengel (1987) found as a result of

being detected by a human, such as by visitors to the Owl Woods. It is unlikely that the constant presence of wind turbines, would startle, or result in disturbance to raptors roosting in the Owl Woods. Overall, the operation of the Project is unlikely to result in disturbance to roosting raptors and owls in the Owl Woods, or other woodland features.

Compared to forest roosting species, there may be higher potential for disturbance to ground roosting species such as Northern Harriers or Short-eared Owls as the Project Location is within potential roosting habitat. Raptors may avoid roosting on the ground in close proximity to operating wind turbines. Project related traffic may also disturb ground nesting birds in proximity to access roads, although traffic is likely to be minimal during operation of the project. During the first three years of operations, regular human presence at some turbines for mortality monitoring may also disturb ground nesting raptors. The potential disturbance in proximity to project components may result in some localized shifting of ground roosting sites. However, results of the field studies conducted for the Evaluation of Significance suggest shifting of roost sites occurs regularly during pre-construction, with Short-eared Owls generally moving between roosts or within a larger roost site on different surveys. Overall, the availability of ground roosting sites does not appear to be a limiting factor within the Study Area and a minimal amount of disturbance that may occur from the operation of the project is unlikely to impact ground roosting raptors.

Amherst Island is anticipated to continue to support large concentration of wintering raptor during operation of the Project. Post-construction monitoring for disturbance will be conducted in all significant raptor wintering areas (RWA1, RWA2, RWA3, RWA4, RWA5, RWA6, RWA7 and RWA8) for a period of three years, to ensure disturbance to wintering raptors is not higher than expected. The Environmental Effects Monitoring Plan (included in the Amherst Island Wind Project Design and Operations Report) describes a response and contingency plan that will be implemented if performance objectives cannot be met.

5.5.3.2 Turtle Overwintering Habitat

Turtle overwintering habitat (TO1) was not evaluated prior to the creation of this report and is required to be evaluated prior to construction. If it is determined to be not significant, the following mitigation measures will not be required. Evaluation methods for turtle overwintering habitat are as follows:

Habitat use studies will be conducted and will include turtle emergence studies to be completed during the early spring (Mar-May). Specifically, observational studies will consist of area searches conducted from the edges of the feature. Observations will be performed in the afternoon, on sunny days when turtles are likely to be basking near their hibernacula site. Each station will be surveyed a minimum of 3 times, with each survey lasting a minimum of 30 minutes.

At each station, the surveyor will observe for a minimum of 30 minutes, recording all species seen, along with an estimate of the number of individuals of each species and behavior observed. Additional information that will be recorded on the appropriate data forms includes:

- Weather conditions (temperature, wind speed (on a Beaufort scale), % cloud cover, and presence of any precipitation should be recorded).
- Date and time of day.
- Location of any turtles observed.
- Name of the observer doing field work.

Given the size and characteristics of the turtle overwintering areas in TO1, it is anticipated that the habitat could potentially support some of the indicator turtle species identified in the Draft Significant Wildlife Habitat Ecoregion 6E Criterion Schedule, including: Midland Painted Turtle, Northern Map Turtle, or Common Snapping Turtle.

Regardless of its significance, potential impacts to turtle overwintering area TO1 during operation of the Project are anticipated to be minimal. The closest project component is an access road 77 m away, which occurs on the opposite side of an existing municipal road. Potential indirect impacts would include wetland degradation from dust, noise or accidental spill. These impacts to wetlands, and mitigation measures, are discussed in **Section 5.6.2**.

Overall, turtle overwintering areas are not anticipated to be significantly impacted by the operation of the project. Therefore no post-construction monitoring is proposed.

5.5.3.3 Migratory Landbird Stopover Area

Four significant migratory landbird stopover and staging areas have been identified within 120 m of the Project Location: ML1, ML2, ML3, ML4 and ML5 (**Figures 5.1-5.5, Appendix A**). No Project components are in this type of significant wildlife habitat.

Information regarding indirect effects of wind turbines on migrating passerines is limited. Of four bird taxa reviewed in 19 separate studies, passerine birds showed the least population response to wind turbines when compared with waterfowl, wading birds and raptors (Stewart et al. 2007). Passerines were also noted not to be vulnerable to displacement (Langston and Pullan 2003, cited in Stewart et al. 2005). However, in a study of six wind energy facilities in Alberta, EchoTrack (2005) found evidence of localized avoidance as birds increased their flight height and slowed their flight speed when they approached wind turbines. This avoidance response may result in increased energy expenditure to migratory birds. The extent to which an avoidance is considered an impact depends on the species, size of wind project, spatial arrangement of the turbines, type of movements (i.e. local movements or annual migrations) and the incurred energetic cost (Masden et al. 2009). Masden et al. (2010) concluded that the energetic cost expended to avoid a wind project was undetectable and insignificant compared with other factors such as strong or unfavourable winds.

The potential for turbines to act as a barrier to movement has also been identified as a potential impact. Reviews of available literature suggest the barrier effect has not been proven to significantly impact bird populations (Drewitt and Langston 2006) however the effect of wind farms as barriers to migratory bird movement is not yet fully understood and has not been well studied (Telleria 2009; Masden et al. 2009). Lateral displacement of migratory flight paths was observed for numerous bird species at two offshore wind farms in Denmark. Peterson et al. (2006) found that 50% fewer migratory bird flocks flew directly over offshore wind turbines, although the decline was much less for daytime migrants compared with nocturnal migrants. Most species changed their flight path orientation at 200 m to 500 m away from the active turbines. No evidence of habituation to the turbines was observed over time (Peterson et al. 2006). Using acoustic surveys, Howe et al. (2002) also observed that nocturnal migrant birds were less abundant over turbine areas when compared with reference sites.

Overall, turbine within the Amherst Island Wind Energy Project have been sited outside of significant migratory landbird stopover areas and are relatively well spaced. As such, disturbance to stopover habitat, or potential barrier effects, are not anticipated to be significant. Post-construction monitoring for disturbance will be conducted in all significant migratory landbird stopover areas (ML1, ML2, ML3ML4 and ML5) for a period of three years, to ensure potential disturbance to migratory landbirds is not higher than expected. The Environmental Effects Monitoring Plan (included in the Amherst Island Wind Project Design and Operations Report) describes a response and contingency plan that will be implemented if performance objectives cannot be met.

5.5.3.4 Old Growth Forest

Potential negative impacts to old growth forests from operation of the Project are anticipated to be minimal. Potential indirect impacts would include woodland degradation from dust, noise or accidental spill. These impacts to woodlands, and mitigation measures, are discussed in **Section 5.6.1**.

Overall, old growth forest habitat is not anticipated to be significantly impacted by the operation of the Project. Therefore no post-construction monitoring is proposed.

5.5.3.5 Amphibian Breeding (Woodland and Wetland)

Potential impacts to significant amphibian breeding habitat (ABWO2, ABWO3, ABWE1 and ABWE2) during operation of the Project are anticipated to be minimal.

No access roads occur within 50 m of amphibian breeding habitat. Given this setback, infrequent day to day uses of the access roads and maintenance activities are unlikely to result in habitat impacts. If required, dust suppression during operation of the Project could be considered.

There may be occasional impacts during maintenance of collector lines. Maintenance of the collector line adjacent to ABWE2 could result in wetland degradation by dust, siltation, erosion or accidental spill. If collector line maintenance activities are required in proximity to ABWE2, mitigation measure used during construction (**Table 14B, Appendix B**) should be implemented.

Effects of turbine noise on amphibian populations are relatively unknown and not-well understood; however, individual reproductive success has been directly related to calling effort in frogs (Sun and Narins 2004). Therefore, noise may be a concern because it can interfere with calling rates, which could in turn impact fitness (Sun and Narins 2004, Penna et al. 2005). As well, noise may not allow breeding frogs to properly hear and move toward breeding aggregations (Maxell and Hokit 1999).

Masking of auditory environmental signals, such as mammal warning cries or amphibian calls, may be significant immediately underneath the turbine (Rabin et al. 2006), but the effects rapidly decline with distance from the turbine. A study of low frequency noise and vibration at a modern wind farm determined that vibration is 1/5th to 1/100th of the limit of human perception within 25 m of the turbine base (Legerton et al. 1996).

In the Amherst Island project layout, only a single turbine is located within 120 m of significant amphibian breeding habitat: S36 which is 114 m away from ABWE1. Considering the setbacks from turbines, masking of auditory signals is not anticipated to have a significant impact on this feature.

During operation of the facility, some materials such as lubricating oils and other fluids associated with turbine maintenance have the potential for discharge on the environment through accidental spills, resulting in a potential impact to amphibian habitat through ground or surface water contamination. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.

5.5.3.6 Marsh Breeding Bird Habitat

Marsh breeding birds are among the more sensitive bird species with respect to disturbance from wind power development. In their meta-analysis of the effect of wind turbines on bird abundance at 19 globally-distributed wind farms, Stewart et al. (2007) concluded that wading birds were the second-most likely bird taxon to demonstrate declines in abundance. Pearce-Higgins et al (2012) found construction disturbance was the primary cause of bird population declines at wind farms (Pearce-Higgins et al 2012). For some species, populations rebounded once construction ceased and turbines became operational, however the apparently more disturbance-sensitive Snipe and Curlew did not return to their pre-construction abundance (Pearce-Higgins et al 2012).

However, as noted for raptors, above, differences in avoidance behaviour have been noted at North American wind development projects when compared with European studies. The single wind turbine at Pickering Nuclear Generating Station, adjacent to the Hydro Marsh, has not

proved to be a deterrent to local marsh breeding birds. Black-crowned Night Herons (*Nycticorax nycticorax*) and Common Terns (*Sterna hirundo*) were observed flying within 50 m of the active turbine and regularly visited the Hydro Marsh (James 2002). At the Erie Shores Wind Farm, Great Blue Heron were relatively scarce due to limited habitat; however, half of the 19 individuals observed in 2006 and 2007 flew within 100 m of operating turbines (James 2008). Post-construction studies at the Wolfe Island Wind Plant did not find any significant declines in species diversity or abundance in the large coastal wetlands adjacent to operational wind turbines; no declines were observed in the common marsh species such as Swamp Sparrow, Marsh Wren and Common Yellowthroat. More sensitive species, such as Least Bittern, were also recorded breeding on Wolfe Island in proximity to operational wind turbines.

At Amherst Island, wind turbines have been sited away from marsh breeding bird habitat; the closest turbine to MBB1 is 119 m away from blade sweep. The closest proposed access road is 78 m away from this habitat. During operation, potential disturbance impacts of Project-related traffic are expected to be minimal and less frequent than day to day use of the road system. Municipal roads are closer to MBB1 than Project access roads. Resident breeding birds nesting along the road edge of this community have likely habituated to the presence of noise and human activity. As such, disturbance impacts from operational wind turbines to breeding birds in MBB1 are expected to be negligible.

5.5.3.7 Woodland Area-Sensitive Breeding Bird Habitat

Potential threats to woodland area-sensitive breeding birds as a result of wind energy projects include fragmentation and disturbance of habitat (Kingsley and Whittam 2007).

At other wind power developments in Ontario, post-construction monitoring studies report no significant negative effects on woodland area-sensitive breeding birds, although in each case turbines were located away from wooded areas. James (2008) found no indication of disturbance or displacement of, woodland birds by operating wind turbines at the Erie Shores Wind Farm. Both number of species and number of individual birds increased from 2006 surveys to 2007. Area-sensitive species, including Yellow-bellied Sapsucker and Hairy Woodpecker were noted on several occasions foraging within 50m of operating turbine towers (James 2008). At the Melancthon I Wind Plant, in central Ontario, post-construction monitoring results revealed no significant difference in woodland bird species densities between points located within 150 m of a turbine and points located further away (Stantec 2007).

Post-construction monitoring of the Wolfe Island Wind Plant included disturbance studies to breeding birds in woodland habitat adjacent to operating wind turbines. The post-construction surveys recorded 51 species, six of which were woodland area sensitive species, which was slightly higher species diversity from pre-construction surveys. During pre-construction 45 species, two of which were area-sensitive, were recorded in the same woodlands using the same survey methods (Stantec 2012c).

During operation, potential disturbance impacts of Project-related traffic are expected to be minimal. There may be occasional impacts during maintenance of access roads or collector lines. Maintenance of the access road and/or collector line adjacent to ABB1 could results in woodland degradation by dust, siltation, erosion or accidental spill. If maintenance activities are required in proximity to ABB1, mitigation measures used during construction (**Table 14B, Appendix B**) should be implemented.

Overall, turbines within the Amherst Island Wind Energy Project have been sited outside of woodland area-sensitive breeding bird habitat with the closest turbine sited 48 m away from blade sweep. As such, disturbance for forest breeding birds is not anticipated to be a significant impact. Post-construction monitoring for disturbance will be conducted in ABB1 for a period of three years, to ensure potential disturbance to forest breeding birds is not higher than expected. The Environmental Effects Monitoring Plan (included in the Amherst Island Wind Project Design and Operations Report) describes a response and contingency plan that will be implemented if performance objectives are not met.

5.5.3.8 Open Country Breeding Bird Habitat and Short-eared Owl Habitat

Disturbance of open country and ground-nesting breeding bird habitat as a result of wind energy projects were identified as potential threats (Kingsley and Whittam 2007). Avoidance by breeding birds of operational turbines would result in indirect loss of habitat and fragmentation.

Studies specific to the wind industry indicate that abundance of breeding birds is not negatively affected at many wind facilities (Kingsley and Whittam 2007). Mountain Plover (*Charadrius montanus*) abundance decreased during construction of a wind power facility, but showed evidence of returning to near pre-construction levels during the operations phase despite a widespread decline in species abundance within the region (Young et al. 2006). Nest locations in this study were noted to be unaffected by distance, with nests as close as 35 m to a turbine base. Most studies to date which document avoidance, disturbance or displacement effects have focused mainly on grassland or open country birds. Studies of bird densities in grassland habitats have documented localized avoidance behavior in some species (Leddy et al. 1999; Johnson et al. 2000; Erickson 2004), from 50 m to 180 m from turbine bases. Mean density of breeding birds in Conservation Reserve Program Grasslands in Minnesota was four times higher at 180 m from the base of a turbine than at 40 m (Leddy et al. 1999). Other studies have shown no avoidance of wind turbines (Shaffer and Johnson 2008; James 2008) while still others show species nesting in higher abundances near turbines (de Lucas et al. 2004).

Post-construction monitoring on Wolfe Island in 2010 and 2011 (Stantec 2011a and 2011c) aimed to compare abundance of grassland breeding birds to pre-construction conditions. The results of the studies found that grassland breeding birds remained very abundant within the project area and within 100m of operational wind turbines. To date, a review of existing research at operating facilities suggests that wind facilities have little impact on the nesting of birds (Strickland et al. 2011). As operational wind turbines are not anticipated to result in significant

displacement of open country breeding birds, it is unlikely the turbines will result in fragmentation of the large contiguous open country breeding bird habitat within the Study Area.

In addition to potential disturbance from turbines, Project related traffic may impact grassland breeding birds, although traffic during operation is expected to be minimal. There may be occasional impacts during maintenance of access roads or collector lines that run through the significant open country habitat. If maintenance activities are required in close proximity, mitigation measures used during construction (**Table 14B, Appendix B**) should be implemented. During the first three years of operations, regular human presence at some turbines for mortality monitoring may also disturb ground nesting birds. Noise levels from operational wind turbines might result in disturbance effects to breeding birds. Habib et al. (2007) found that noise from compressor stations (which produce sound at 75 to 90 dB(A) at the source) reduced pairing success of Ovenbirds (a forest songbird) by 15%. Levels of noise that may be experienced by open country breeding birds from operation of the wind turbines is influenced by a number of factors such as distance from receptor, direction of the receptor (i.e. up or down wind) or weather effects (wind speed and direction). For example, noise from wind turbines are more likely to have the least effect on wildlife at high wind speeds, as the sound from the turbines can be masked by the sound of the wind. Reijnen et al. (1996) suggest that noise levels that are below 47 dB(A) will not have significant effects on breeding birds. Barber et. al. (2010) suggest that physiological responses to noise exposure in animals may begin to appear at exposure levels of 55- 60 dB(A). Studies also indicate that birds adjust their songs to compensate for environmental background noises (Burmm 2004; Barber et al. 2010) and that many species of wildlife easily habituate to regular noise (Penna et al. 2005).

Short-eared Owls may be more vulnerable to disturbance effects than other open country breeding birds and may avoid nesting in close proximity to operational wind turbines. As observed during post-construction winter raptor surveys on Wolfe Island, Short-eared Owls may avoid hunting in close proximity to operational wind turbines. However, the Wolfe Island results suggest this relatively limited habitat disturbance did not impact raptor abundance, suggesting Short-eared Owls and other raptors were not significantly impacted in their ability to find and capture prey. In 2010, Keyes (2011) recorded an active breeding pair of Short-eared Owl within the 86-turbine Wolfe Island Wind Plant. Although this nest was unsuccessful due to damage from farm machinery, it demonstrates Short-eared Owls are able to establish and maintain breeding territories within active wind farms in southern Ontario.

Project components, including wind turbines, have been sited in areas where Short-eared Owls have been observed breeding by Keyes (2011) in 2009 and 2010 and by Stantec in 2011. However, Keyes (2011) found low site fidelity between years on Amherst Island, indicating that breeding territories from previous years are not necessarily good indicators of locations of future territories. As result, siting turbines away from nesting territories recorded in previous years was not necessarily considered effective mitigation to avoid impacts to Short-eared Owls. Overall, considering the distribution of proposed wind turbines on Amherst Island and the apparent shifting of Short-eared Owls breeding territories from year to year, it is likely that breeding

territories will often overlap with wind turbine locations. Given the relatively small amount of Short-eared Owl breeding habitat that could be potentially disturbed by the Project, it is anticipated the ability of breeding pairs to establish suitable breeding territories on Amherst Island will not be impacted.

Overall, operation of the Project, with access and wind turbine sited in grassland habitat, is not anticipated to result in significant disturbance or fragmentation to open country breeding bird habitat. Breeding Short-eared Owls may show some localized avoidance to nesting or hunting in close proximity to operations wind turbines. However, considering the relatively minimal amount of habitat that may be impacted, the presence of wind turbines is not expected to impact the breeding density or success of Short-eared Owls on Amherst Island.

Post-construction monitoring for disturbance will be conducted in all significant open country breeding habitat (OCB1, OCB2, OCB3, OCB4, OCB5, OCB6, OCB7, OCB8 and OCB9) for a period of three years. The monitoring will aim to measure and quantify potential disturbance impacts to open county breeds, including Short-eared Owls, to ensure potential disturbance is not higher than expected. The Environmental Effects Monitoring Plan (included in the Amherst Island Wind Project Design and Operations Report) describes a response and contingency plan that will be implemented if performance objectives cannot be met.

5.5.3.9 Shrub/Early Successional Bird Breeding Habitat

Disturbance of habitat as a result of wind energy Projects were identified a potential threat to breeding birds (Kingsley and Whittam 2007). Turbines within the Amherst Island Wind Energy Project have been sited outside of shrub/early successional bird breeding habitat. As such, disturbance for shrubland breeding birds is not anticipated to be a significant impact. During operation, potential disturbance impacts of Project-related traffic are expected to be minimal and less frequent than day-to-day use of the road system. Municipal roads are closer to both SSB1 and SSB2 than Project access roads. Resident breeding birds nesting along the road edge of this community have likely adapted to the presence of noise and human activity.

Post-construction monitoring for disturbance will be conducted in SBB4 and SBB5, which are within 120m of proposed turbine locations. Monitoring is proposed for a period of three years, to ensure potential disturbance to shrubland breeding birds is not higher than expected. The Environmental Effects Monitoring Plan (included in the Amherst Island Wind Project Design and Operations Report) describes a response and contingency plan that will be implemented if performance objectives cannot be met.

5.5.4 Areas of Natural and Scientific Interest (ANSI)

The Amherst Bay Life Science ANSI is formed by the Long Point Coastal Marsh PSW. The environmental effects and mitigation measures are the same for these features. See **Section 5.5.2**.

5.6 MONITORING PLAN

O. REA Reg. 359/09 requires that applicants prepare an Environmental Effects Monitoring Plan (EEMP) as part of the Design and Operations Report to demonstrate how any negative environmental effects (direct and indirect) of the Project will be mitigated and to set out a program for ongoing monitoring of the effectiveness of mitigation measures. The EEMP includes a description of:

- Performance objectives in respect of each negative environmental effect
- All mitigation measures planned to achieve performance objectives
- How the Project will be monitored to ensure that mitigation strategies are meeting performance objectives, and
- A contingency plan to be implemented should monitoring reveal that mitigation measures have failed

The EEMP covers potential impacts to natural features that were identified through the Environmental Impact Study of this report. Specifically, the EEMP includes monitoring for impacts to natural features during construction, and post-construction monitoring for disturbance to significant wildlife habitat (raptor wintering areas, landbird migratory stopover areas, woodland area sensitive breeding bird habitat, open country breeding bird and Short-eared Owl breeding habitat and shrubland/early successional breeding bird habitat). **Table 17B, Appendix B** summarizes the proposed monitoring of impacts to natural features, including the methods to be used, locations of monitoring, frequency of sample collection, how the results of the monitoring plan will be reported and contingency measures that will be undertaken.

In addition to impact to natural features and significant wildlife habitat, the EEMP also addresses potential direct impacts on wildlife (i.e, mortality). In accordance with O. Reg. 359/09, the direct impacts are addressed through the EEMP, including mitigation measures, monitoring requirements and contingency plans. However, a discussion of the direct impacts to wildlife using significant wildlife habitat in the Study Area is provided below for convenience.

5.6.1 Overview of Direct Impacts

Various studies have been conducted throughout North America to document bird collisions at wind facilities, to determine why collisions may be occurring, and to understand the extent to which they occur. Results of these studies on different groups of birds utilizing significant wildlife habitat on Amherst Island are provided below.

Raptors and Owls

Due to the concentration of raptors on Amherst Island during the winter, there is some risk of mortality. Some of the species present are known to hover while hunting, or fly erratically at dusk, potentially making them susceptible to collisions with the wind turbines. Because raptors

have relatively low reproductive rates, population recovery from mortality effects can be slow (Kingsley and Whittam 2007). Post-construction mortality studies at the Wolfe Island Wind Plant have been extended through the winter, to monitor potential fatalities to wintering raptors. Results from the 3 years of post-construction monitoring have found relatively few raptor fatalities during the winter months, despite the high concentration of raptors in the project area. Overall, based on these results, direct mortality is not likely to have a significant impact on the wintering raptor population on Amherst Island.

According to the Wind Energy Bird and Bat Monitoring Database (Environment Canada et al. 2012), no Short-eared Owl or other owl fatalities has been recorded at Ontario windfarms to date. The monitoring database shows that owl mortality across all wind farms in Canada has been very low. This is likely due to their low flying nature and potentially the keen hearing of owls that alert them to the presence of wind turbines. It can be expected the risk of mortality from turbine collision to wintering and breeding owls on Amherst Island would be low.

Migratory Landbirds

Based on a review of available literature, it appears that most collisions are of nocturnal migratory songbirds (Kingsley and Whittam 2007), at least partly because they are the most abundant species at wind energy facilities (National Academy of Sciences 2007). In addition, most fatalities at operational facilities in Canada have been found from May through October, with the fall migration period (August to October) experiencing 51% of all fatalities (Environment Canada et al. 2012).

Landbirds typically migrate in broad fronts (Drewitt and Langston 2008; Diehl et al. 2003; Ewert et al. 2006). Studies suggest that most passerines migrate at altitudes above the height of wind turbines (Zimmerman 1998); however, when ascending or descending as they cross the lake, or when traveling in low cloud or fog conditions, birds may be at increased risk of collision with man-made structures.

Recent research examining the relationship between risk factors and recorded bird mortality did not find a relationship between the abundance of migratory birds and the number of bird collisions per turbine, indicating that bird use does not necessarily equate to high mortality rates (Ferrer et al. 2011). Rather, Ferrer et al. (2011) found that the probability of collisions depends on species behaviours and topographical factors. Individuals whose behaviour does not place it within the rotor swept zone are considered to be at lower risk of collisions with turbines (USFWS 2012). Additionally, under many conditions, some birds have demonstrated the ability to detect and alter flight paths to avoid collision (EchoTrack Inc. 2005; Plissner et al. 2008; USFWS 2012).

“Nearshore” turbines (defined as those within 250 m of the lakeshore) were shown to be responsible for a disproportionate amount of bird and bat mortality at the Erie Shores Wind Project, which is also located at a shoreline location in a raptor migration corridor (but in an agricultural landscape found along Lake Erie) (James 2008). James (2008) estimated that bat

mortality could be reduced by 50% and bird mortality by 80% at the Erie Shores Wind Project if turbines were not placed in the “nearshore” area. Research has also shown that migrants select forested areas in close proximity to water and may be particularly concentrated in riparian woodlands located within 400 m of the lakeshore (Bonter et al. 2008; Ewert et al, 2006). No nearshore turbines – defined as those within 250 m of the lakeshore – have been proposed on Amherst Island.

Monitoring results to date from operational facilities indicate that wind turbines are not a major concern with respect to the sustainability of migratory bird populations in Ontario (Friesen 2011; MNR 2011c) and are a small contributor to overall bird mortality when compared to other anthropogenic structures (e.g. collisions with building and communications towers or mortality from agricultural practices) (Arnett et al. 2007; Kingsley and Whittam 2007; National Academy of Sciences 2007; Kerlinger et al. 2011).

Breeding Birds

Collision risk is partly a function of the rate of exposure of birds to the turbine blade sweep and types of behaviour that occur within this range. 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). Although some behaviors of resident birds, such as aerial displays (e.g. Killdeer or Upland Sandpiper) or actively hunt within the blade sweep area (e.g. Tree Swallow) may put them at higher risk.

Mortality rates are available for several operating wind projects, including Wolfe Island Wind Plant, located approximately 10 km east of Amherst Island. Amherst Island is very similar to Wolfe Island with regard to habitat and geography. Like Wolfe Island, Amherst Island supports the high densities of grassland breeding birds and late summer staging swallows and therefore may experience similar rates of avian mortality.

The taller tower height on Amherst Island may result in reduced mortality to grassland birds. The bottom of the blade swept of the proposed Amherst Island turbines will be at 45 m high, 10 m higher than the turbines on Wolfe Island. As such, fewer aerial displaying breeding birds are likely to attain the height of the blade sweep and therefore at risk of collision. However, the long blade length, and thus the large blade sweep area, may result in a higher number of birds at risk of collision.

Generally, forest breeding birds are at lower risk than some grassland and shrubland species, as forest breeding birds do not conduct high-risk behaviours such as aerial displays. During the first three years of the Wolfe Island Wind Plant post-construction monitoring, only one forest breeding bird fatality, a Wood Thrush, has been recorded during the breeding bird season (Stantec 2010a, 2010b, 2011a, 2011b and 2011c).

The marsh breeding bird species found breeding on Amherst Island in proximity to the Project Location include American Bittern, Virginia Rail, Marsh Wren, Common Loon, Great Blue Heron, and Green Heron. These species are not expected to engage in high risk behaviours during breeding season; life cycle activities for these species (mating, foraging, and rearing of young) typically occur at heights that are below the blade sweep zone. While Wilson's Snipe are not specifically identified as marsh species, they were recorded in the marsh habitats within the Project Area. These species conduct aerial mating displays and may be at higher risk to collisions with turbines.

The shrub/successional breeding bird species found on Amherst Island in proximity to the Project Location include Brown Thrasher, Field Sparrow, Eastern Towhee, Willow Flycatcher and Black-billed Cuckoo. These species are not expected to engage in high risk behaviours during breeding season and typically occur at heights that are below the blade sweep zone. While Wilson's Snipe and American Woodcock are not specifically identified as shrub/successional species, they were recorded in the shrub/successional habitats within the Project Area. These species conduct aerial mating displays and may be at higher risk to collisions with turbines.

Overall, the annual fatality rate for all birds on Wolfe Island is likely a reasonable indicator of fatality rate on Amherst Island. This rate has been higher than average for wind power facilities; 13.4 birds/turbine/year during the first year of operation (2009/2010) and 10 birds/turbine/year during the second year of operation (2010-2011). The higher mortality rates on Wolfe Island can be attributed partially to the high density of grassland breeding birds and the large number of late summer staging swallows; similar risk factors occur on Amherst Island. Monitoring results to date from operational facilities indicate that wind turbines are not a major concern with respect to the sustainability of migratory bird populations in Ontario (Friesen 2011; MNR 2011c) and are a small contributor to overall bird mortality when compared to other anthropogenic influences (e.g. farming practices and house cats) (Arnett et al. 2007; Kingsley and Whittam 2007; National Academy of Sciences 2007; Kerlinger et al. 2011). Friesen (2011) concludes the mortality rates at Wolfe Island are likely not significant with respect to local or regional populations of species, in part because the mortality is spread among at least 58 species.

The mortality rates observed to date at operational facilities in Ontario are considered low, with no evidence of large scale fatality events or significant population impacts (Friesen 2011). Monitoring results to date from operational facilities indicate that wind turbines are not a major concern with respect to the sustainability of migratory bird populations in Ontario (Friesen 2011; MNR 2011c) and are a small contributor to overall bird mortality when compared to other anthropogenic influences (Arnett et al. 2007; Kingsley and Whittam 2007; National Academy of Sciences 2007; Kerlinger et al. 2011).

5.7 SUMMARY OF IMPACTS AND MITIGATION

The Project will result in the erection of up to 36 wind turbines as well as the installation of supporting infrastructure, such as access roads, electrical cabling, and a substation. Through a comprehensive review of background material in conjunction with site-specific investigations and Evaluation of Significance surveys, several significant, or presumed significant, natural features and wildlife habitats have been identified in or within 120 m of the Project Location.

As part of this Environmental Impact Study, a series of monitoring commitments and mitigation measures have been recommended to be implemented as part of the development of this Project. These recommendations have been developed in association with the specific significant natural features and wildlife habitats that have been identified within the Study Area.

The application of these protective, mitigation, and compensation measures are expected to address any negative environmental effects of construction, operation and decommissioning of the Project on the natural heritage features in the Study Area and their associated ecological functions.

6.0 Closure

This NHA and Environmental Impact Study for the Windlectric Inc. Amherst Island Wind Energy Project has been prepared in accordance with O.Reg 359/09, s. 24-28 and 37-38.

The application of these protective, mitigation, and compensation measures are expected to address any negative environmental effects of construction, operation and decommissioning of the Project on the natural heritage features in the Study Area and their associated ecological functions. An environmental effects monitoring plan that includes a post-construction monitoring program will be developed to confirm the accuracy of predicted effects as well as to monitor the effects to other natural elements. Mortality monitoring, as required and described by the MOE, is described in the environmental effects monitoring plan, and will be conducted for three years following construction.

Stantec Consulting Ltd. prepared this NHA and Environmental Impact Study for Windlectric Inc. for the Amherst Island Wind Energy Project. Windlectric Inc. is committed to implementing the appropriate protection and mitigation measures as they apply to the construction and operation of the proposed Project.

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