Ministry of Natural Resources

Confirmation Letter

April 2, 2013

Ministry of
Natural Resources
Renewable Energy Operations Team
300 Water Street
4th Floor, South Tower
Peterborough, Ontario K9J 8M5

Ministère des
Richesses naturelles

Ontario

April 2nd, 2013

Niagara Region Wind Corporation
277 Lakeshore Road East, Suite 211
Oakville, Ontario L6J 6J3

RE: NHA Confirmation for Niagara Region Wind Farm

Dear Darren Croghan:

In accordance with the Ministry of the Environment's (MOE's) Renewable Energy Approvals (REA) Regulation (O.Reg.359/09), the Ministry of Natural Resources (MNR) has reviewed the Niagara Region Wind Farm – Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm in the Townships of West Lincoln and Wainfleet, the Town of Lincoln, and within Haldimand County submitted by Niagara Region Wind Corporation on March 26th, 2013.

In accordance with Section 28(2) and 38(2)(b) of the REA regulation, MNR provides the following confirmations following review of the natural heritage assessment:

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, if no natural features were identified.
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), MNR also offers the following comments in respect of the project.

Preconstruction Monitoring

In accordance with Appendix D of MNR's NHA Guide, a commitment has been made to complete pre-construction assessment(s) of habitat use for the following candidate significant wildlife habitats

- Migratory Land-bird Stopover Area (features misa3 and misa4. Fall-surveys only)
- Bat Maternity Colony (features bmc1, bmc3, bmc6, bmc7, bmc8, bmc9, bmc10, bmc11, bmc12, bmc13, bmc14, bmc15, bmc16, bmc17, bmc18, bmc19, bmc20, bmc23, bmc24, bmc25, bmc26, bmc27, bmc28, bmc29, bmc30, bmc31, bmc32, bmc33, bmc34, bmc35, bmc36, bmc37, bmc38, bmc39, bmc42, bmc43, bmc44, bmc45, bmc46, bmc47, bmc48, bmc49, bmc50, bmc51, bmc52, bmc53, bmc54, bmc55)
- Turtle Wintering Area (feature tw1)
- Snake Hibernacula (features sh2, sh3, sh4, sh6, sh7)
- Turtle Nesting Habitat (features th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69)

MNR has reviewed and confirmed the assessment methods and the range of mitigative options. Pending completion of the assessments and determination of significance, the appropriate mitigation is expected to be implemented, as committed to in the environmental impact study.

Access road to Turbine 89

A field visit must be conducted with MNR prior to construction to determine site specific impacts of the proposed access road. If upon completion of the site assessment it is determined that negative impacts to the ANSI cannot be mitigated as determined in the NHA, **MNR does not support the proposed access road location**. The proponent may submit an addendum report detailing a new access road location, potential negative effects and mitigation measures for MNR's consideration.

Post-Construction Monitoring

In addition to the NHA, Environmental Effects Monitoring Plans (EEMP) that address post-construction mortality monitoring and mitigation for birds and bats must be prepared and implemented. Environmental Effects Monitoring Plans for birds and bats must be prepared in accordance with MNR Guidelines and should be reviewed by MNR in advance of submitting a REA application to MOE in order to minimize potential delays in determining if the application is complete. Comments provided by the MNR with respect to the EEMP must be submitted as part of the application for a REA.

A commitment has been made in the Environmental Effects Monitoring Plan, part of the Design and Operations Report, to conduct post-construction monitoring and if determined necessary, implement mitigation measures. For the Niagara Region Wind Farm this includes;

- Migratory Land-bird Stopover Area (features misa1, misa3, misa4)
- Raptor Wintering Area (wr1, wr2, wr3, wr4)

- Bat Maternity Colony (features bmc1, bmc3, bmc6, bmc7, bmc8, bmc9, bmc10, bmc11, bmc12, bmc13, bmc14, bmc15, bmc16, bmc17, bmc18, bmc19, bmc20, bmc23, bmc24, bmc25, bmc26, bmc27, bmc28, bmc29, bmc30, bmc31, bmc32, bmc33, bmc34, bmc35, bmc36, bmc37, bmc38, bmc39, bmc42, bmc43, bmc44, bmc45, bmc46, bmc47, bmc48, bmc49, bmc50, bmc51, bmc52, bmc53, bmc54, bmc55)
- Turtle Nesting Habitat (features th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69)
- Amphibian Breeding Habitat (Woodland) (features ah2, ah9, ah29, ah31, ah37, ah38, ah49, ah57, ah61, ah89)
- Amphibian Breeding Habitat (Wetland) (features ah25, ah35, ah83)

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 NHA, MNR may need to undertake additional review of the NHA.

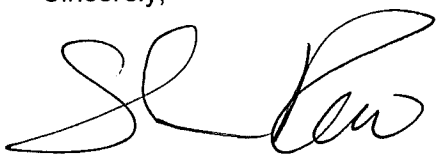
Where specific commitments have been made by the applicant in the NHA/EIS with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNR expects that these commitments will be considered in MOE's Renewable Energy Approval decision and, if approved, be implemented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

In accordance with S.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.

Please be aware that your project may be subject to additional legislative approvals as outlined in the Ministry of Natural Resources' *Approvals and Permitting Requirements Document*. These approvals are required prior to the construction of your renewable energy facility.

If you wish to discuss any part of this confirmation or additional comments provided, please contact Amy Cameron at amy.cameron@ontario.ca or 613-732-5506.

Sincerely,



Sharon Rew
A\Regional Resources Section Manager
Southern Region MNR

cc Ian Hagman, Guelph District Manager, MNR
Narren Santos, Environmental Approvals Access & Service Integration Branch, MOE
Zeljko Romic, Environmental Approvals Access & Service Integration Branch, MOE

Natural Heritage Assessment and Environmental Impact Study

NIAGARA REGION WIND FARM -
NATURAL HERITAGE ASSESSMENT AND
ENVIRONMENTAL IMPACT STUDY

File No. 160950269
March 26, 2013

Prepared for:

Niagara Region Wind Corporation
277 Lakeshore Road East, Suite 211
Oakville, Ontario L6J 6J3

Prepared by:

Stantec Consulting Ltd.
49 Frederick Street
Kitchener, OntarioN2H 6M7

Executive Summary

Niagara Region Wind Corporation (NRWC) is proposing to develop, construct, and operate the 230 megawatt (MW) Niagara Region Wind Farm (the Project) within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and within Haldimand County in Southern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

The Project Study Area is centred in the Townships of West Lincoln and Wainfleet and is generally bounded by: i) Castor Gainsborough Road to the West; ii) the Queen Elizabeth Way to the North; iii) the north shore of Lake Erie to the South and iv) Balfour Street to the East. The proposed Project Study Area is provided in **Figure 1**, **Appendix A**.

The basic components of the Project include 77 wind turbine generators (80 potential locations identified) each with a rated capacity of approximately 3.0 MW for a maximum installed nameplate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into nine collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 MVA base rated transformer with two stages of cooling (via fans). A 115kV transmission line transports power from each of the two transformer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (QEW) in Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

Other Project components include access roads, associated culverts at swales and waterbody crossings, and an operations and maintenance building. Temporary components during construction may include temporary laydown areas (for storage and staging areas at each turbine location), crane pads or mats, staging areas along access roads, delivery truck turnaround areas, central construction laydown areas and crane paths.

This Natural Heritage Assessment and Environmental Impact Study is intended to satisfy the requirements outlined within O.Reg. 359/09 (s. 24 through 28, 37 and 38) and is to be submitted as a component of the REA application. The records review report, site investigation report, evaluation of significance report and Environmental Impact Study (for significant features located in or within 120 m of the Project Location) as required by O.Reg. 359/09 are found within this document.

Background data were collected and reviewed to identify natural features located in, or within 120 m of the Project Location. The results of the records review were used to determine

whether the Project Location is in a natural feature, within 50m of an Earth Science Area of Natural and Scientific Interest (ANSI), or within 120 m of other natural features.

Natural features present within 120m of the Project Location, confirmed during the site investigation, and requiring an evaluation of significance (O.Reg. 359/09, s. 27) included wetlands, woodlands, ANSIs, Provincial Plan Areas and several candidate significant wildlife habitat features in the area.

Natural heritage information collected from the records review, the site investigation and consultations were analyzed to determine the significance and sensitivity of existing ecological features and functions. Based on this evaluation, several provincially and locally significant wetlands, significant woodlands, significant ANSIs, and significant wildlife habitat, including where such natural features occur within the Greenbelt and Niagara Escarpment Plan Areas, were identified within 120 m of the Project Location.

An EIS is provided for each significant natural feature located within 120 m of the Project Location. The EIS identifies and assesses any negative environmental effects and proposes mitigation measures to minimize and mitigate the potential negative impacts associated with the planning, design, construction, and operation of the proposed Project.

Once the identified protective, mitigation and compensation measures are applied to the environmental features discussed above, the construction and operation of the Project is expected to have acceptable net negative effects on the significant features and functions identified through the Natural Heritage Assessment process. An environmental effects monitoring plan that includes a post-construction monitoring program will be developed to confirm the accuracy of predicted effects as well as to monitor the effects to other natural elements.

Information dealing with the presence of Threatened or Endangered species and habitat are subject to the *Endangered Species Act* and are beyond the scope of this NHA / EIS. Through consultation with the MNR, NRWC and Stantec have been and will be reviewing the implications of this Act to the Project and, where appropriate, will be preparing any necessary Permit applications for submission to the MNR in conjunction with the submission of the REA application and supporting documents to the MOE.

Table of Contents

Table of Contents

Table of Contents

Table of Contents

List of Tables

Table of Contents

List of Appendices

List of Figures

Appendix A

Table of Contents

List of Tables

Appendix B

1.0 Introduction

Niagara Region Wind Corporation (NRWC) is a renewable energy development company based in Oakville, Ontario and is dedicated to providing renewable energy for Ontario. Further information can be found on their website at www.nrwc.ca.

NRWC is proposing to develop, construct, and operate the 230 megawatt (MW) Niagara Region Wind Farm (the Project) within the Townships of West Lincoln and Wainfleet and the Town of Lincoln within the Niagara Region and within Haldimand County in Southern Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province. Project infrastructure such as collector lines and transmission lines will be sited along the boundaries of the Township of Pelham and Town of Grimsby, but will be sited outside of these municipalities on the opposite side of the road.

The location of the Project Study Area is shown on **Figure 1, Appendix A**.

1.1 PROJECT OVERVIEW

The basic components of the Project include 77 wind turbine generators (80 potential locations identified) each with a rated capacity of approximately 3.0 MW for a maximum installed nameplate capacity of 230 MW. An overhead and/or underground collection system connects each turbine to one of two transformer substations along a series of 34.5 kilovolt (kV) lines. Turbines are grouped into nine collector circuits that bring power (and data via fibre optic lines) to one of the transformer substations. Voltage is stepped up from 34.5kV to 115kV at each transformer substation by means of a 100 MVA base rated transformer with two stages of cooling (via fans).

A 115kV transmission line transports power from each of the two transformer substations north to the tap-in location where the Project is connected to the Hydro One Networks Inc. (HONI) owned transmission line, south of the Queen Elizabeth Way (QEW) in Lincoln. Power generated from this Project will be conveyed along the existing HONI transmission line to the Beach Transformer Station in Hamilton.

Alternate transmission and collector lines routes have been identified and assessed to provide options during detailed design, the final selection of which route to follow will be confirmed following the consultation process, agency review and detailed design.

Other Project components include junction boxes, access roads, and associated culverts at swales and waterbody crossings. Temporary components during construction may include temporary laydown areas (for storage and staging areas at each turbine location), crane pads or mats, staging areas along access roads, delivery truck turnaround areas, central construction laydown areas and crane paths.

Further details pertaining to the design, construction and operation of the project components are provided in the Design and Operations Report and Construction Plan Report.

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

1.2 STUDY AREA AND PROJECT LOCATION

The Project will be located on privately owned land and within municipal rights-of-way (ROWs) in Niagara Region and Haldimand County.

O. Reg. 359/09 defines the Project Location as:

> "*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 air space in which a person in engaging in or proposes to engage in the project*".

For the purposes of this Project, the "Project Location" includes the footprint of the facility components, plus any temporary work and storage locations. The boundary of the Project Location is used for defining setback and site investigation distances according to O. Reg. 359/09. The buildable area (construction area) includes the footprint of the facility components, plus any temporary work and storage locations on private lands possibly required during the construction of the Project. All construction and installation activities would be conducted within this designated area, including construction vehicles and personnel. All installation activities related to collector lines would be contained within the boundaries of the municipal road allowance (opened and unopened), with the exception of where collectors are located on participating private properties.

Although O. Reg. 359/09 considers the REA process in terms of the Project Location, the siting process for wind projects is an iterative process, and therefore final location of Project components is not available at Project outset. Therefore, a Project Study Area is developed to examine the general area within which the wind Project components may be sited; information gathered within this larger area feeds into the siting exercise.

The "Study Area" used for the records review component of this NHA report is shown on **Figure 1**, **Appendix A**.

The proposed "Project Location", as defined in O. Reg. 359/09, includes any air space and all parts of the land in, on or over which the Project is proposed. As required by the regulation, a 120 m "Zone of Investigation" has been identified around the outer limits of the Project Location; measured as 120 m from the outer limit of the Project Location, where site preparation and construction activities will occur and where infrastructure will be located (MNR, 2011a). The outer limit includes the turbine blade tip where that component forms the outer limit of the

Project Location. The Project Location and 120 m Zone of Investigation are shown on **Figure 2, Appendix A**.

This Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) has been prepared in accordance with O.Reg. 359/09, and is one component of the REA application for the Project.

2.0 Renewable Energy Approval Requirements

2.1 RENEWABLE ENERGY APPROVALS

NRWC 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). According to subsection 6(3) of O.Reg.359/09, the Project is classified as a Class 4 Wind Facility and will follow the requirements identified in O.Reg.359/09 for such a facility.

Ontario Regulation 359/09 (as amended by O. Reg. 195/12) issued under the *Environmental Protection Act* outlines the application, approval, consultation and reporting requirements necessary to obtain approval of a renewable energy project, such as a wind, solar, thermal treatment or anaerobic digestion facility.

This Natural Heritage Assessment (NHA) and Environmental Impact Study (EIS) report is intended to satisfy sections 24 through 28, 37 and 38 of O. Reg. 359/09. It has been prepared through consultation with the Guelph District and Southern Region MNR with guidance from the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a) for submission as a component of the REA application for this Project.

Pursuant to O. Reg. 359/09, an NHA is required for all renewable energy projects, which must include a records review (s. 25), site investigation (s. 26) and evaluation of significance (s. 27) for any natural features in or within 120 m of the Project Location.

The location, boundaries, characteristics and significance of the following natural features and areas must be determined in relation to the project location:

- wetlands, including coastal, northern and southern wetlands;
- woodlands;
- wildlife habitat;
- life science and earth science areas of natural and scientific interest (ANSIs); and
- provincial parks and conservation reserves.

Any sand barren, savannah, tallgrass prairie or alvar vegetation communities must also be considered where a Project occurs within the Protected Countryside identified under the *Greenbelt Plan*or within the Oak Ridges Moraine Conservation Plan Area identified under the *Oak Ridges Moraine Conservation Act*. The Project is not located within the Oak Ridges Moraine Conservation Plan Area, however portions of the transmission line are located within the Protected Countryside of the Greenbelt Plan and therefore an assessment of these vegetation communities is required under O. Reg. 359/09.

A portion of the transmission line for this Project is also located within the Niagara Escarpment Plan Area, as approved under the *Niagara Escarpment Planning and Development Act*. Consideration for the protection of the Niagara Escarpment Plan Area are beyond the scope of this report, however, will be addressed through on-going consultation with the Niagara Escarpment Commission and implemented through the issuance of a Development Permit to be submitted as part of the Renewable Energy Approval application to the MOE.

The results of the NHA are intended to identify any significant natural features located within 120m of the Project Location, for which the completion of an EIS is required in accordance with section 38 of O. Reg. 359/09. An EIS must be completed in accordance with MNR procedures (as amended from time to time) and must identify and assess any negative environmental effects of the Project, identify appropriate mitigation measures and describe how the environmental effects monitoring plan and construction plan will address any negative environmental effects (O. Reg. 359/09, s. 38(2)(a)).

Prohibitions for the construction, installation or expansion of a renewable energy generation facility exist for provincially significant southern wetlands, provincially significant coastal wetlands, or a provincial park or conservation reserve (unless otherwise permitted under the *Provincial Parks and Conservation Reserves Act*, 2006) (O. Reg. 359/08, s. 37). Renewable energy generation facilities may be permitted within the following areas subject to the completion of an EIS:

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

The NHA and EIS report is submitted to the MNR for review prior to the submission of a REA application to the MOE. Written confirmation from the MNR (s. 28(3)(b)), as well as any written comments received from the MNR (s. 28(3)(c)) based on their review, must be submitted along with the NHA and EIS to the MOE as part of the REA application. In accordance with the Regulation, MNR must confirm that:

- the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established by MNR;

- the site investigation and records review were conducted using applicable evaluation criteria or procedures established or accepted by MNR, if no natural features are identified;
- the evaluation of significance or provincial significance of natural features was conducted using applicable evaluation criteria or procedures established or accepted by MNR; and
- the project location is not in a provincial park or conservation reserve.

Consideration for the identification and protection of endangered and threatened species protected under the *Endangered Species Act, 2007* is beyond the scope of this report. In consultation with the MNR, NRWC and Stantec have been and will be reviewing the implications of the Endangered Species Act to the Project and, where appropriate, will be preparing any necessary permit applications for submission to the MNR in conjunction with the submission of the REA application and supporting documents to the MOE.

2.2 GUIDANCE DOCUMENTS

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

- Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2012);
- Bats and Bat Habitats Guideline for Renewable Energy Projects (MNR, 2011b);
- Birds and Bird Habitats Guideline for Renewable Energy Projects (MNR, 2011c);
- Natural Heritage Reference Manual (MNR, 2010);
- Significant Wildlife Habitat Technical Guide (MNR, 2000);
- Significant Wildlife Habitat Decision Support System (MNR, undated);
- Ontario Wetland Evaluation System, Southern Manual (MNR, 2002); and
- Draft Significant Wildlife Habitat Ecoregion 7E Criteria Schedules (MNR, 2012).

3.0 Records Review

3.1 METHODS

This records review report was prepared in accordance with Section 25 of O.Reg. 359/09.The information obtained during this process was used to gather information about the area in which a project location is proposed, to identify the presence of known natural features, and to make preliminary determinations about site feasibility to guide the development of initial project layouts.

A variety of background documents and sources of information were reviewed during the preparation of this report, including consultation with the public, various agencies and organizations. Sources of background information included, but were not limited to, the following:

Provincial

- Ontario Ministry of Natural Resources (MNR). Background information request submitted August 9th, 2011. MNR provided background information on natural heritage features and species at risk for the Project Study Area in writing on August 25th, 2011. Stantec was in correspondence with Guelph District staff (Renewable Energy Planning Ecologist) ongoing from August 2011 to May 2012 and Southern Region Renewable Energy Operations Team Coordinator) from June 2012 to present;
- Natural Heritage Information Centre (NHIC) database. June 2010. Natural Areas and Species records search. Biodiversity explorer, https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/mainSubmit.do. OMNR, Peterborough. Accessed January 2012;
- Ontario Ministry of Natural Resources (MNR). 2009. Land Information Ontario (LIO) digital mapping of natural heritage features;
- Wetland Evaluation Records (various). Ministry of Natural Resources;
- Species at Risk Public Registry. 2009. Accessed July 2011.
- Renewable Energy Atlas. 2010. Bat hibernacula mapping;
- Bats and Bat Habitats: Guidelines for Wind Power Projects. July 2011. Ontario Ministry of Natural Resources;
- Birds and Bird Habitats. Guidelines for Wind Power Projects. October 2010. Ontario Ministry of Natural Resources;
- Greenbelt Plan. 2005. Ministry of Municipal Affairs and Housing;
- Niagara Escarpment Plan. 2011. Niagara Escarpment Commission;

- A summary report of the earth science areas of natural and scientific interest in Niagara district. 1983. Ministry of Natural Resources; and
- Significant Natural Areas along the Niagara Escarpment. 1976. Ministry of Natural Resources.

ConservationAuthorities

- Natural Areas Inventory. Volume 1 and 2. 2006-2009. Niagara Peninsula Conservation Authority (NPCA);
- Niagara Peninsula Conservation Authority (NPCA) regulation mapping. 2010. http://npca.ca/water-management/watershed-regulation/flood-plain-mapping.htm;
- Grand River Conservation Authority (GRCA) watershed mapping. 2010. http://grims.grandriver.ca/imf/imf.jsp?site=grca_viewer&ddsid=7177c1;
- Conservation Area records (various). NPCA and GRCA.
- Background information request dated August 6, 2012 to GRCA and NPCA and meeting with Drew Cherry, Resource Planner at GRCA and Ian Barrett, Biologist at NPCA on November 17, 2011.

Local Municipal Government

- Niagara Region Policy Plan. 2010 and Core Natural Heritage Mapping. 2007;
- Haldimand County Official Plan. Consolidated June 2009;
- Haldimand County Official Plan (2006) and associated Schedules and Appendices;
- Township of West Lincoln Official Plan (2010) and associated Schedules
- Township of Wainfleet Official Plan. Consolidated 2000.
- Town of Lincoln Official Plan. Consolidated 2010.

Other Data Sources

- Atlas of the Mammals of Ontario (Dobbyn, 1994)
- Ontario Herpetofaunal Atlas internet database (Oldham and Weller, 2000)
- Breeding Bird Atlas (Cadman et al., 1987)
- Important Bird Areas database (Bird Studies Canada and BirdLife International, undated);
- Ontbirds Archives (various years).

A summary of agencies contacted, information requested and responses received is provided in **Table 3.1, Appendix B**. Comments received from MNR are included as **Appendix C**.

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 within 120m of the Project Location (50 m for Earth Science ANSIs) is detailed below (Section 3.2)

3.2 RESULTS

A review of available background information has indicated the presence of known natural features occurring in and within 120m of the Project Location. The results of the records review search were used to determine whether the Project Location is in a known natural feature, within 50m of an Earth Science ANSI, or within 120m of other known natural features (as defined in Section 2.1).

A description of each known natural feature is provided in this section of the report and the location of each natural feature identified through the records review is shown on **Figures 2.1 – 2.58**, **Appendix A**.

3.2.1 Wetlands

Based on the records review, a number of evaluated and unevaluated wetlands occur in and within 120m of the Project Location. Provincially and locally significant wetlands, as well as unevaluated wetlands, that occur in and within 120m of the Project Location have been identified through LIO mapping, NHIC database, wetland evaluations records received from the MNR, Niagara Peninsula Conservation Authority (NPCA) mapping (2010), Grand River Conservation Authority (GRCA) mapping (2010), or local government Official Plan mapping.

The records review indicates the presence of 154 evaluated wetland units in 16 provincially significant wetland (PSW) complexes and 4 locally significant wetland complexes (LSW), as well as numerous pockets of unevaluated wetland, in and within 120m of the Project Location. Nine (9)evaluated wetlands units are mapped within the Project Location.

Each wetland as identified by these sources, and its location relation to the Project Location, is shown on **Figures 2.1 – 2.58**, **Appendix A**.

3.2.1.1 Provincially Significant Wetlands

Beaver Creek Wetland Complex – This wetland complex is comprised of 46 wetland units, consists of 78% swamp and 22% marsh, and is located in an within 120m of the Project Location. It is reported to contain habitat for Bullfrogs and Snapping Turtles and supports fish spawning (Common Carp and Brown Bullhead). This site is also a recorded nesting habitat for colonial waterbirds. The wetland complex is located in the subwatershed of Beaver Creek in West Lincoln. All wetland units are contained with this catchment of the Welland River. There is a high percentage of marsh associated with this wetland which is a rare habitat feature for the Niagara Region. Swamps are more associated with the headwater reaches and the marshes along the watercourse. Important linkages are the Welland River where the resident Northern

Pike population makes use of these creek marsh areas for spawning in the spring season. Resident fish species include the SAR Grass Pickerel.

Bismark North West Slough Forest Wetland Complex – This wetland complex is comprised of 8 individual wetlands and composed of two wetland types (98% swamp and 2% marsh). This is a slough forest swamp headwater wetland complex consisting of 8 wetland units within 750m of each other and located within the subwatershed of Black Ash Creek of the Welland River. This was once a more contiguous slough forest presently divided into these units by rural and agricultural development. The former contiguity is still evident by the remnant slough patterns found in the agricultural fields. Important linkages for seed, amphibian, reptile and small mammal movement (annual dispersals and seasonal movements) include active and successional agricultural fields, hedgerows, adjacent uplands and watercourses. Evidence of this ongoing connection is the presence of these species throughout the complex indicating that dispersal mechanisms are functioning as a minimum within the spatial limits of this complex.

Chippawa Creek Slough Forest Wetland Complex– This wetland complex is comprised of 17 individual wetlands, composed of 100% swamp. It is located in the headwaters of Little Forks Creek and an unnamed tributary. Once a contiguous slough forest, it is now fragmented into several smaller units by successional and active agricultural fields. The vegetation community is similar throughout with a dominant Maple, Ash overstorey. Wildlife (reptiles, amphibians and mammals) readily move between these units.

Fifteen Mile Creek Above Escarpment Wetland – This wetland complex is comprised of 48 individual wetlands, composed of 2 wetland types (88% swamp and 12% marsh). It is located in the subwatershed of Fifteen mile creek and receives ground and surface water flow from the Fonthill Kame moraine. Linkages between wetlands include creeks and connecting watercourses, hedgerows, closely associated uplands, both active and successional agricultural fields. Karsts and bedrock outcroppings along watercourses provide hibernacula for the endangered Black Ratsnake and the more common Eastern Gartersnake.

Headwaters of Big Forks Creek Wetland Complex –This wetland complex consists of 28 individual wetlands, is comprised of 100% swamp, and is situated within 120m of the Project Location. Found in the sub catchment of Big Forks Creek, this complex is a slough forest system with a Maple, Ash, Oakoverstory and fragmented by agricultural and rural areas. Watercourses, uplands, hedgerows and agricultural fields (active and not active) serve as linkages between wetland units and provide dispersal mechanisms for reptiles (Snapping turtles), amphibians (Wood Frog, Green Frog, Leopard Frog, Spring Peeper and Western Chorus Frog) and mammals (Raccoon, Coyote, Skunk and Red Fox). This wetland is reported to support nesting of colonial waterbirds, as well as habitat for Bullfrogs

Highway 20 and 24 Wetland Complex– This wetland complex is composed of 11 individual wetlands and composed of one wetland type (100% swamp). This once contiguous slough forest is now fragmented into units by present agricultural use. However, linkages remain in the form of closely associated uplands, the railroad corridor, as well as active and successional

agricultural fields. These linkages provide dispersal for wildlife and seed dispersal, including Spring Peepers, Western Chorus Frogs, American Toad, Green Frog, Bullfrog and Northern Leopard Frog. Some specialized species with limited distribution were found in the wetland, such as Southern Arrowood, Pin Oak and Black Gum. Other species present include Coyote, Red Fox, Striped Skunk, Raccoon and Virginia Opossum.

Lower Twenty Mile Creek Wetland Complex– This wetland complex is comprised of 120 individual wetlands with two wetland types (88% swamp and 12% marsh). The complex provides habitat for fish, Bullfrogs, Snapping Turtles, Raccoon, Muskrat, Red Fox and Coyote. Provincially significant wildlife known to occur here includes Jefferson's Salamander, Eastern Ribbonsnake and Milksnake.

Marshville Station Clay Plain Wetland Complex – This wetland complex is comprised of 12 individual wetlands and consists of one wetland type (100% swamp). This slough forest with a dominant Maple, Oak, Ash overstorey is fragmented by agricultural fields, uplands and hedgerows. These areas, the wetland itself, as well as drainage areas provide habitat and linkages for the movement of wildlife such as Blanding's Turtle, Milksnake, amphibians, Deer, Raccoon and small mammals.

Moulton East Wetland Complex– This wetland complex is comprised of 9 individual wetlands and composed of one wetland type (100% swamp). The complex is located in the Mill Race Creek subwatershed and is in close proximity to the Lowbanks PSW complex. The swamp communities with a slough forest pattern are fragmented by active and successional agricultural fields. Linkages include hedgerows, uplands, watercourses and fields. The wetland provides habitat for species with large home ranges, such as the Blanding's Turtle. Other species present include Bullfrog, Snapping Turtles, Raccoon, Muskrat, Mink, Red Fox, Coyote and Opossum.

Moulton West Wetland Complex– This wetland complex is comprised of 9 individual wetlands and composed of two wetland types (99% swamp and 1% marsh). The slough wetland was once contiguous and is now fragmented by current agricultural use. The wetland units are linked by hedgerows, watercourses, adjacent fields and associated uplands. This complex provides habitat for Bullfrogs, Raccoon, Opossum, Red Fox, Mink and Muskrat.

Old Welland Feeder Canal Wetland – This wetland complex is comprised of three individual wetlands and composed of two wetland types (66% swamp and 34% marsh). This wetland complex is partially naturalized man made habitat that was historically designed to convey water from the Grand River above the Dunnville Dam to the Welland Shipping Canal in Welland. This long linear wetland provides habitat (breeding, feeding and hibernation) and movement corridors for many aquatic and semi-aquatic species, several of which are provincially significant. Species known to use this habitat include Fish, Bullfrogs, Raccoon, Skunk, Mink, Muskrat and Beaver. Provincially significant species include Snapping Turtle, Blanding's Turtle and Eastern Ribbonsnake.

Port Davidson Slough Forest Wetland Complex – This wetland complex consists of 16 individual wetlands and is comprised of two wetland types (95% swamp and 5% marsh). This once contiguous slough is now fragmented by active and successional agricultural fields. Current linkages (adjacent fields, hedgerows and associated uplands) provide dispersal and movement corridors for regional species of amphibians (Bullfrogs), reptiles (Snapping Turtles) and mammals (Raccoon, Striped Skunk).

Silverdale Wetland Complex– This wetland is composed of one wetland type (100% swamp) and is a fragmented slough forest with linkages in the form of watercourses, uplands, hedgerows and the active and successional agricultural fields that fragment the once contiguous wetland. The present connectivity allows for the movement and dispersal of wildlife including amphibians, reptiles (Snapping Turtle) and mammals (Muskrat, Raccoon, Red Fox, Coyote).

St. Ann's Slough Forest Wetland Complex– This wetland complex is comprised of 11 individual wetlands and composed of one wetland type (100% swamp). Rural and agricultural land use has fragmented this once contiguous slough forest wetland. Linkages between the wetland units include watercourses, hedgerows, associated uplands and active and successional agricultural fields. These linkages enable regional amphibian populations to complete their life cycle, as well as provide habitat requirements for reptile and mammal species. Wildlife species found to occur in this complex consist of Bullfrog, Snapping Turtle, Raccoon, Mink, Red Fox, Coyote and Muskrat.

Upper Beaver Creek Wetland Complex – This wetland complex consists of 27 individual wetlands and is comprised of two wetland types (98% swamp and 2% marsh). This slough forest wetland is located in the Beaver Creek watershed and consists of units separated by abandoned and active agricultural fields. Hedgerows, seasonal watercourses, agricultural fields and associated uplands provide linkages between wetland units which provide a means of movement and dispersal for regional and local populations of amphibians, reptiles, mammals. Species known to occur in this wetland complex include Bullfrog, Raccoon, Virginia Opossum, Red Fox, Mink and Muskrat.

Welland River West Wetland Complex – This wetland complex is comprised of 39 individual wetlands and composed of two wetland types (88% marsh and 12% swamp). Associated with the Welland River West hydrology, water levels are controlled at the Grassy Island pool on the Niagara River for hydroelectric production. As a result, water level fluctuations occur, particularly during the summer season. Spring flows are less controlled and result in the flooding of the river into adjacent wetlands. Fish spawning migration occurs in the river and wetlands along the nearshore edge provide habitat for small and predatory fish. Important linkages for wildlife include the river and associated watercourses, associated uplands, hedgerows, as well as active and successional agricultural fields. Other wildlife species present include Bullfrog, Snapping Turtle, Raccoon, Skunk, Mink, Short-tailed weasel, River Otter and Muskrat.

3.2.1.2 Locally Significant Wetlands

Hutchinson Road Wetland Complex – This wetland complex consists of 8 individual wetlands and is composed of one wetland type (100% swamp). All of the wetland units have a dominant Maple, Oak overstorey. The units are separated by active agricultural fields; important linkages for wildlife include watercourses, hedgerows, and agricultural fields and associated uplands. Wildlife species known to occur in this complex include Raccoon, Red Fox and Coyote.

Spring Creek Woodlots – This individual wetland is comprised of two wetland types (92% swamp and 8% marsh). It provides winter cover for deer and habitat for Gartersnake, Green Frog, Leopard Frog, Bullfrog, Muskrat and Raccoon. The above information is from a 1985 evaluation. An attempt to re-evaluate in 1987 found that the creek bed was dredged and the natural features were impaired to such a degree that the evaluators no longer considered the area a wetland.

Sucker Creek Wetland Complex – This wetland complex consists of 3 individual wetlands and is composed of one wetland type (100% swamp). It is located on the North side of the Welland River within the Sucker Creek subwatershed. Connectivity may exist between this complex and the Wiley Road Wetland Complex (non PSW) but requires verification. Additional field work and species surveys recommended for this wetland.

Upper Sixteen Mile Creek Wetland Complex – This wetland complex is comprised of 10 individual wetlands and is composed of two wetland types (67% swamp and 33% marsh). This complex, located in the subwatershed of Sixteen Mile Creek, contains a large proportion of marsh which is a regionally rare wetland type. Closely associated with the watercourse, seasonal flooding into the marsh creates fish spawning and nursery habitat; spring and fall congregations of Mallards and Canada Geese also occur in the marsh habitat. The swamp communities contain a dominant Maple, Ash, Elm overstorey. Linkages between wetland units include Active and abandoned agricultural fields, hedgerows, and watercourses (ditches, swales and creek tributaries). Other wildlife known to occur in the area includes Raccoon, Muskrat, Striped Skunk and Coyote.

3.2.1.3 Unevaluated Wetlands

Eight hundred and three (803) pockets of unevaluated wetlands were identified by MNR, NPCA and GRCA as occurring in or within 120m of the Project Location through the records review. Thirteen (13) of these unevaluated wetlands are mapped within the Project Location.

3.2.1.4 Coastal Wetlands

Coastal Wetlands are defined as wetlands that are located:

a) on Lake Ontario, Lake Erie, lake Huron, Lake Superior or Lake St. Clair,

b) on the St. Mary's, St. Clair, Detroit, Niagara or St. Lawrence River, or

c) on a tributary to any water body mentioned in clause a) or b) and, either in whole or in part, downstream of a line located 2 km upstream of the 1:100 year floodline (wave run-up included) of the water body. (O. Reg. 359/09).

Based on this definition and through NHIC results, the Upper Sixteen Mile Creek Wetland is considered a coastal wetland. This coastal wetland is located within 120m of the Project Location, along the northern shoreline of Lake Erie. Several of the unevaluated wetlands identified by the GRCA and NPCA along the various tributaries to Lake Erie would also be considered coastal wetlands.

3.2.1.5 Summary

One hundred and fifty-four (154) evaluated wetlands within 16 PSW complexes and 4LSW complexes, as well as 803pockets of unevaluated wetland, were mapped in and within 120 m of the Project Location through the records review. Site investigations will be undertaken to confirm the presence and boundaries of these wetlands and to identify any additional wetland features in or within 120m of the Project Location.

3.2.2 Woodlands

As defined in s. 63(1) of O. Reg. 521/10, a "woodland" is defined as a treed area, woodlot or forested area, other than a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees, that is located south and east of the Canadian Shield.

The Project is located in the Niagara section of the Deciduous Forest Region (Rowe, 1972), also known as the Carolinian Forest. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak and bur oak, butternut, bitternut hickory, rock elm, silver maple and blue beech. Species such as black cherry, black walnut, sycamore, swamp white oak and shagbark hickory are also occasionally present. Species considered rare to the province such as pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present. Needle-leaved trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar and black spruce may be found in isolated patches where soil conditions are favorable.

Haldimand County is estimated to contain 17.12% forest cover (GRCA, 2004). Woodlands have not been identified in the *Haldimand County Official Plan*, but are to be identified as part of a Natural Environment Study (Greenlands Study) proposed to be completed by the County (Haldimand County, 2006). Once identified, any significant woodlands will be mapped as an overlay on Schedule E of the Haldimand County OP.

Woodland coverage in the Niagara Region is 18.98% according to municipality cover data in Section 6.1.2 of the Niagara Peninsula Conservation Authority's (NPCA) Natural Areas Inventory, 2010. The Niagara Region Official Plan (2010) defines significant woodlands based on woodlands that satisfy the following criteria:

a) Contain threatened or endangered species or species of concern;

b) In size, be equal to or greater than:

   - 2 hectares, if located within Urban Area Boundaries;
   - 4 hectares, if located north of the Niagara Escarpment;
   - 10 hectares, if located south of the Escarpment;

c) Contain interior woodland habitat (i.e. at least 100 m in from the edge);

d) Contain older growth forest;

e) Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4; or

f) Abut or be crossed by a watercourse or water body and be 2 ha or more in area.

Based on the above criteria, significant woodlands are located throughout the Study Area. These woodlands are delineated on the Niagara Region Natural Heritage Map (Niagara Region, 2010) (**Figure 2.1**, **Appendix A**), and are classified as either: 1) Environmental Protection Areas or 2) Environmental Conservation Areas, both of which are considered to be Core Natural Areas. Due to the level of detail on this map, habitats are not individually separated. The location and size of significant woodlands have been identified through air photo interpretation, area calculations through GIS and field investigations.

MNR's LIO mapping (2010) and aerial photography indicate the Project Location and 120 m Zone of Investigation is primarily agricultural but does contain a number of woodlands of varying sizes. Many of the woodland features are associated with wetlands and are included as part of wetland complexes described above, while a few occur in isolation. Woodlands as mapped by the MNR are shown on **Figures 2.1 – 2.58**, **Appendix A**.

In total, 265 woodlands were identified as occurring in or within 120 m of the Project Location. Site investigations are required to confirm the presence and boundaries of all woodlands in or within 120 m of the Project Location.Twelve (12) of these woodlands are mapped within the Project Location. Site investigations will be undertaken to confirm the presence and boundaries of these woodlands and to identify any additional woodland features in or within 120 m of the Project Location.

3.2.3 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 (O. Reg. 359/09; MNR, 2010). These habitats are grouped into four categories:

- Habitats of seasonal concentrations of animals;
- Rare vegetation communities or specialized habitat for wildlife;
- Habitat of species of conservation concern; and,
- Animal movement corridors.

The *Significant Wildlife Habitat Technical Guide* (MNR, 2000) defines what wildlife habitats are considered significant in Ontario. More specifically, *the Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule* (MNR, 2012) identifies the wildlife habitats to be considered for significance within this area of the Province and, in accordance with MNR direction, has been used as the primary guidance document for wildlife habitat.

A compilation of background information on known wildlife use in and within 120 m of the Project Location was undertaken. Using this information, a preliminary assessment was conducted to identify wildlife habitat features that may be present in, or within, 120 m of the Project Location to determine whether the area contains confirmed significant wildlife habitat (SWH) or involves a trigger for candidate SWH.

The Project Location is situated between Lake Ontario and Lake Erie. Air photo interpretation indicates that the Project Location footprint is comprised of actively managed agricultural lands with natural wildlife habitat provided primarily by wetlands and woodlots along with various watercourses and drainage features. There are no designated Important Bird Areas, National Wildlife Areas or Provincial Wildlife Areas identified in and within 120 m of the Project Location.

Secondary data sources were used to determine potential wildlife use in or within 120 m of the Project Location. Inventories of wildlife that have been recorded as occurring within the vicinity of the Project Location 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) and the *Ontario Breeding Bird Atlas* (Cadman et al., 2007).

Based on a review of background information, 133 species of birds, 30 species of mammals, 19 species of reptiles and 16 species of amphibians are known to occur within the Study Area (**Appendix D**). It is important to note that the exact location of species occurrences are not available from these atlases and, instead, are recorded within 10 x 10 km squares. The potential for species to be present within the Project Location will be limited by the habitat suitability and availability supported in and within 120 m of the Project Location. Therefore, the identified species recorded from these databases may not occur in or within 120 m of the Project Location.

3.2.3.1 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 SWH Ecoregion 7E Criterion Schedule (MNR, 2012) identifies 15 potential types of seasonal concentration areas:

- Deer winter congregation areas;
- Colonial bird nesting sites (bank and cliff);
- Colonial bird nesting sites (tree/shrub);
- Colonial bird nesting sites (ground);
- Waterfowl stopover and staging areas (terrestrial);
- Waterfowl stopover and staging areas (aquatic);
- Shorebird migratory stopover areas;
- Landbird migratory stopover areas;
- Raptor wintering areas;
- Bat hibernacula;
- Bat maternity colonies;
- Bat migratory stopover areas;
- Turtle wintering areas;
- Snake hibernaculum; and
- Migratory butterfly stopover areas.

A review of background information to assess the potential for these seasonal concentration areas to be present in and within 120 m of the Project Location is provided in the following sections.

Deer Winter Congregation Areas

Deeryards 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. White-tailed deer are known to occur in and within 120m of the Project Location (Dobbyn, 1994). Deer congregation areas have been identified by MNR as woodland areas greater than 100 ha in size. A total of 135 features identified by MNR as deer winter congregation areas have been identified in and within the Project Location and are shown on **Figures 2.1 – 2.58**, **Appendix A**. Thirteen (13) of these features are mapped within the Project Location. The extent of these woodland features will be confirmed during site investigations.

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, banks and artificial structures for swallows (MNR, 2000).Based on the record review, the following PSWs indicate the presence of Colonial Bird Nesting Sites:

- Beaver Creek Wetland;
- Chippawa Creek Conservation Area Wetland;
- Fifteen Mile Creek Above Escarpment Wetland;
- Highway 20 and 24 Woodlots Wetland;
- Marshville Station Clay Plain Wetland;
- Moulton East Wetland;
- Moulton West Wetland;
- Old Welland Feeder Canal Wetland;
- Silverdale Wetland;
- St. Ann's North Woodlots Wetland; and
- Welland River West Complex

Site investigations will determine whether colonial bird nesting sites are found in or within 120 m of the Project Location.

Waterfowl Stopover and Staging Areas (terrestrial and aquatic)

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, 2012). Marshes along Great Lakes shorelines are considered particularly valuable.

No known waterfowl stopover and staging areas occur within 120 m of the Project Location. Site investigations will determine whether waterfowl stopover and staging areas are found in or within 120 m of the Project Location.

Shorebird Migratory Stopover Areas

Relatively undisturbed shorelines along lakes, rivers, and wetlands that produce abundant food (clams, insects, snails and worms) are used by shorebirds during migration (MNR, 2012). No known shorebird migratory stopover areas are known to occur in and within 120 m of the Project Location. Site investigations will determine whether shorebird migratory stopover areas exist in or within 120 m of the Project Location.

Landbird Migratory Stopover Areas

Migratory passerines are known to use forested landscapes along Great Lakes shorelines as stopover sites during spring and fall migration (Ewert et al., 2006; 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, 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, 2012).Many of the best sites are found within 2 km of the Lake (MNR, 2000) with recent research indicating migrants select forested areas in close proximity to water and may be particularly concentrated in riparian woodland located within 400 m of the lakeshore (Bonter et al., 2008; Ewart et al. 2006).

No known historic migratory landbird stopover areas occur within the Study Area. However, Rock Point Provincial Park, which occurs southwest of the Study Area, is a known migratory bird stopover area and has a permanent bird banding station to record use. In addition, the Beamer Memorial Conservation Area in Grimsby, which occurs northwest of the Study Area, is a known location where the Niagara Peninsula Hawkwatch volunteers observe migratory raptors using the updrafts along the Niagara Escarpment during spring migration.

The Study Area includes large natural areas within 5 km of Lake Erie. Site investigations will determine whether landbird migratory stopover areas exist in or within 120 m of the Project Location.

Winter Raptor Feeding and Roosting Areas

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, 2012).

No known winter raptor feeding or roosting areas occur in or within 120 m of the Project Location. However, most of the Study Area provides suitable habitat for winter raptors; open fields including hay, pasture and meadows with scattered, abutting woodlands for roosting sites. The open agricultural setting is likely to provide habitat for small mammal prey and potential perch sites, such as fence posts, are common. As such, the potential exists for winter feeding

and roosting sites in and within 120 m of the Project Location as the Great Lakes and Niagara Escarpment are known to facilitate raptor movement.

Results of the Dunnville Christmas Bird Count indicate several winter raptor species present in and within 120m of the Project Location (National Audubon Society, 2010). These species include: American Kestrel, Bald Eagle, Cooper's Hawk, Great Horned Owl, Long-eared Owl, Northern Harrier, Red-tailed Hawk, Rough-legged Hawk, Sharp-shinned Hawk and Short-eared Owl.

Site investigations will determine if winter raptor feeding or roosting areas exist in or within 120 m of the Project Location.

Bat Hibernacula, Maternity Roosts and Migratory Stopover Areas

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. Although no known bat hibernacula have been identified in and within 120 m of the Project Location(MNR, 2010a), areas of karst have been identified within Haldimand County and Niagara Region. Caves are also known to occur along the Niagara Escarpment that may be suitable for hibernating bats. Site investigations will determine whether bat hibernacula exist in or within 120m of the Project Location.

Maternity Roosts

Depending on the species, maternity roosts for bats can include tree foliage, tree cavities and crevices under loose bark, or buildings. Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes

Candidate significant wildlife habitat for bat maternity roosts may be found in mixed or deciduous forests that contain a high density (10 per hectare or more) of large diameter (25 cm diameter at breast height (dbh) or more) snags or cavity trees (MNR 2011a). The best candidate trees or snags for bat maternity roosts within these habitats are considered according to the following criteria (in order of importance): those that are the tallest; have cavities or crevices; have a large dbh; are within the highest density of snags/cavity trees; have a large amount of loose, peeling bark; have a cavity or crevice more than 10 m high; are tree species that provides good cavity habitat (i.e. aspen, maple, ash, oak or white pine), are within an open canopy; and exhibit early stages of decay.

No known maternity roosts occur in and within 120m of the Project Location. Site investigations will determine whether bat maternity roosts exist in or within 120m of the Project Location.

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, although Long Point has been identified as a significant stopover habitat for Silver-haired Bats (OMNR, 2012).

Criteria for confirming bat migration corridors and bat movement corridors are not currently defined in the *Significant Wildlife Habitat Guide* or *SWH Ecoregion 7E Criterion Schedule* meaning that the evaluation and confirmation of significant wildlife habitat is not possible for this category (MNR, 2012). Also, the *Bats and Bat Habitats: Guidelines for Wind Power Projects* states that in the absence of criteria, bat migratory stopover areas cannot currently be evaluated (MNR, 2011). As a result, it is not possible to identify candidate significant wildlife habitat for this group of species during migration.

Turtle Wintering Areas

Over-wintering sites for turtles are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.

No known turtle wintering areas occur in and within 120m of the Project Location. Site investigations will be conducted to determine whether candidate significant wildlife habitat for turtle wintering areas exist in or within 120m of the Project Location.

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 snakes to hibernate below the frost line (MNR, 2000). These areas are often associated with water to prevent desiccation of the species.

The Study Area is located within the ranges of various common species of snakes (Oldham and Weller, 2000). There are no known reptile hibernacula in and within 120m of the Project Location. Site investigations will determine whether snake hibernacula exist in or within 120m of the Project Location.

Migratory Butterfly Stopover Areas

During fall migration, some species of butterflies (i.e. Monarchs) stop to feed, rest or wait for inclement weather to pass before attempting to cross Lake Ontario and Lake Erie (MNR, 2000). Large woodlands and open fields (>20 ha) within 5 km of the Lake Erie shoreline are considered most significant. Habitat should not be disturbed with an abundance of nectar plants and woodland edges (MNR, 2012).

During fall migration, general patterns in movement occur, in particular the routes used to cross the Great Lakes. Monarchs can be observed throughout southern Ontario along shoreline areas during migration; however these areas do not host the significant thousands that regularly occur at the main staging areas. The majority of fall migrating monarchs in Ontario use three such staging areas: Point Pelee, Long Point, and Presqu'ile Point (C. Taylor, pers. comm., 2006).

There are no known butterfly stopover areas in the Study Area, however, several large natural areas occur within 5km of Lake Erie. Site investigations will determine whether this type of seasonal concentration area is supported in or within 120m of the Project Location.

3.2.3.2 Rare Vegetation Communities or Specialized Habitats

Rare Vegetation Communities

The *Draft SWH Ecoregion 7E 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.*

Information provided by the MNR (2011) and NHIC database (2011) indicate 15 provincially rare communities could occur in or within 120m of the Project Location. Based on the records from the Natural Areas Inventory (NPCA, 2010), 19 regionally rare (RR) vegetation communities were identified as potentially occurring in or within 120m of the Project Location. In addition, 27 different rare community types have been identified within Appendix M of the *SWHTG*(2000) for Niagara and Haldimand. The following is a consolidated list from these various sources identifying the known rare vegetation community types that may exist within the Study Area:

- Dry Lichen – Moss Open Alvar Pavement (ALO1-1);
- Sea Rocket Sand Open Beach (BBO1-1);
- Leatherleaf Shrub Bog Type (BOS1-1);
- Leatherleaf Shrub Kettle Peatland (BOS2-1);
- Highbush Blueberry Shrub Bog (BOS1-?);
- Cliffbrake – Lichen Carbonate Open Cliff (CLO1-1);
- Bulblet Fern – Herb Robert Carbonate Open Cliff (CLO1-2);

- Moist Open Carbonate Cliff Seepage (CLO1-4);
- Round-leaved Dogwood Carbonate Cliff (CLS1-2);
- White Cedar Treed Carbonate Cliff (CLT1-1);
- Dry-Fresh Sugar Maple – Hardwood Calcareous Shallow Deciduous Forest (FODR1-1);
- Dry-Fresh Black Oak Deciduous Forest (FOD1-3);
- Dry-Fresh Mixed Oak Deciduous Forest (FOD1-4);
- Dry-Fresh Oak – Hickory Deciduous Forest (FOD2-2);
- Fresh-Moist Sugar Maple – Black Maple Deciduous Forest (FOD6-2);
- Fresh-Moist Black Walnut Lowland Deciduous Forest Type (FOD7-4);
- Fresh-Moist Black Maple Lowland Deciduous Forest (FOD7-5);
- Fresh-Moist Sassafras Deciduous Forest (FOD8-2);
- Graminoid Coastal Meadow Marsh (MAM4-1);
- Mineral Fen meadow marsh (MAM5-1);
- Beach Grass – Wormwood Open Graminoid Sand Dune (SBOD1-4);
- Juniper Shrub Dune (SDS1-3);
- Cottonwood Treed Dune Type (SDT1-1);
- White Pine Mineral Coniferous Swamp (SWC2-1);
- Bur Oak Mineral Deciduous Swamp (SWD1-2);
- Alder Mineral Thicket Swamp Type (SWT2-1);
- Southern Arrow-wood Mineral thicket Swamp (SWT2-11);
- Alder organic Thicket Swamp Type (SWT3-1);
- Buttonbush Organic Thicket Swamp (SWT3-4);
- Poison Sumac Organic Thicket Swamp (SWT3-13);
- Dry-Fresh Carbonate Open Talus (TAO1-1);
- Fresh-Moist Carbonate Open Talus (TAO1-2);
- Mountain Maple Carbonate Shrub Talus (TAS1-2);
- Dry-Fresh White Cedar Carbonate Treed Talus (TAT1-2);
- Dry-Fresh White Birch Carbonate Treed Talus (TAT1-3);
- Fresh-Moist Sugar Maple Carbonate Treed Talus (TAT1-4);
- Fresh-Moist Hemlock-Sugar Maple Carbonate Treed Talus (TAT1-6);

- Dry Tallgrass Prairie Type (TPO1-1);
- Dry Black Oak-Pine Tallgrass Savannah (TPS1-2); and
- Dry Black Oak-White Oak Tallgrass Woodland (TPW1-1).

Site investigations will determine whether these types of rare vegetation communities exist in or within 120m of the Project Location.

Specialized Habitats

Specialized habitats are microhabitats that are critical to some wildlife species. The Draft SWH Ecoregion 7E Criterion Schedule identifies 7 types of specialized habitats:

- Waterfowl nesting area;
- Bald Eagle and Osprey nesting, foraging, and perching habitat;
- Woodland raptor nesting habitat;
- Turtle nesting habitat;
- Seeps and springs;
- Amphibian breeding habitat (woodland); and
- Amphibian breeding habitat (wetland).

A review of background information to assess the potential for these specialized habitats to be supported in or within 120 m of the Project Location is provided in the following sections.

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, 2012).

No known waterfowl nesting sites occur in and within 120m of the Project Location, although potential habitat may be present in the Upper 16 Mile Creek Wetland Complex and the Headwaters of Big Forks Creek Wetland Complex. Site investigations will determine whether this type of specialized habitat for wildlife is supported in or within 120m of the Project Location.

Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat and Woodland Raptor Nesting Habitat

The SWHTG indicates that some raptors require somewhat specialized habitats. 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 (MNR 2012).

The Project is located within the proximity of two Great Lake shorelines, allowing the potential for Osprey or Bald Eagle nesting sites (LIO, 2009; Cadman et al., 2007). Bald Eagle nests are found primarily along the Great Lakes shorelines in Ontario. One known bald eagle nest occurs greater than 1 km west of the Project Location along the east side of the Grand River (Pers. Comm. GRCA, NHIC). There are no known osprey nests in or within 120 m of the Project Location.

Site investigations will determine the potential presence of these two specialized wildlife habitat features in or within 120m of the Project Location.

Turtle Nesting Habitat

Sandy or fine gravel soils 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 (i.e. shoreline beaches) adjacent to turtle habitat (weedy wetlands, lake or river shorelines).

No turtle nesting sites are known to occur in or within 120 m of the Project Location. Various species of turtles are known to occur within the range of the Project Location (Appendix X; Oldham and Weller, 2000). Site investigations will determine the presence of candidate turtle nesting habitat in or within 120m of the Project Location.

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. Those that occur within forested areas where the canopy maintains cool, shaded conditions are most important. No known seeps or springs occur in and within 120m of the Project Location. The presence of seeps and springs in and within 120m of the Project Location will be identified during site investigations.

Amphibian Breeding Habitat (woodland)

Woodland ponds may provide important habitat for local amphibian populations. Ponds that contain a variety of vegetation structures 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, 2000).

Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. 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.

The Ontario Herpetofaunal Summary (Oldham and Weller, 2000) indicates the Study Area falls within the range of a number of common amphibian species. Woodlands are present in and

within 120m of the Project Location and may provide amphibian habitat. Site investigations will determine whether candidate significant wildlife habitat for amphibian woodland breeding exists in or within 120m of the Project Location.

Amphibian Breeding Habitat (wetland)

These habitats include wetland areas greater than 120m from woodland habitats. Wetlands and pools (including vernal pools) >500m2 (about 25m diameter) supporting high species diversity are significant. The presence of shrubs and logs increases the significance of ponds for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.

Wetland amphibian species including bullfrogs are known to occur in and within 120m of the Project Location. Site investigations will determine whether candidate significant wildlife habitat for amphibian wetland breeding exists in or within 120m of the Project Location.

3.2.3.3 Habitat for Species of Conservation Concern

Habitats of species of conservation concern do not include habitats of Endangered or Threatened Species as identified by the *Endangered Species Act*(MNR, 2000), but rather include:

- Marsh Bird Breeding Habitat;
- Bird Breeding Habitat (woodland area-sensitive, open country, and shrub/early successional);
- Terrestrial Crayfish; and
- Special Concern and Rare Wildlife Species.

Within the context of O.Reg. 359/09, Endangered and Threatened species are addressed separately from the NHA and EIS as part of MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (APRD) requirements. Information in this regard is covered under the requirements of the *Endangered Species Act* through direct consultation with the MNR under separate cover. Where this information indicates that approvals or permits are required, these will be addressed separately through the applicable permitting process.

A review of background information to assess the potential for habitat for species of conservation concern that are associated with southern Ontario and may be supported in the Study Area is provided in the following sections.

Marsh Bird Breeding Habitat

Wetlands that contain shallow water with emergent aquatic vegetation should be considered as potential Marsh Breeding Bird Habitat (MNR, 2012). Site investigations will determine whether this type of habitat is supported in or within 120m of the Project Location.

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

Woodlands and areas of open country of at least 30 ha with at least 4 ha of interior forest habitat (based on a 200 m internal buffer) are considered to have the potential to host populations of sensitive bird species (MNR, 2012). The Ontario Breeding Bird Atlas information indicates that the 10x10 km atlas squares that encompass the Study Area contain records of woodland and open country sensitive breeding birds.

Agricultural habitat is found in the Study Area that could support open country breeding bird species. Areas that are actively managed for agricultural activities are considered disturbed systems and are not considered candidates for significant wildlife habitat (MNR, 2012). 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).

Actively managed agricultural fields in or within 120m of the Project Location are not considered candidate significant wildlife habitat for open country breeding bird species. Natural grassland areas may be present in or within 120m of the Project Location that may support significant habitat for open country breeding bird species. Site investigations will be conducted to determine whether candidate significant wildlife habitat for area-sensitive open country species is present in or within 120m of the Project Location.

The potential for the Study Area to support populations of forest, grassland or shrub/successional birds designated as declining by PIF was considered. The Ontario Breeding Bird Atlas has a record of 35 PIF species located in and within 120m of the Project Location and surrounding area. The Partners in Flight (PIF) information suggests that the Study Area is located within an area of southern Ontario that supports high-very high relative densities of all priority avian species. In particular, priority species associated with shrub-successional are supported in moderate-high relative densities, and priority species associated with grassland or forest habitats are supported in low-moderate relative densities (Ontario PIF, 2008).

In total, 9 woodlots within 120m of the Project Location are greater than 30 ha in size with at least 4 ha of interior forest habitat, and may support area sensitive forest birds. Site investigations will be conducted in these locations to determine whether candidate habitat for area-sensitive woodland species is present in or within 120m of the Project Location.

Shrub thicket habitats greater than 10 ha are most likely to support and sustain a diversity of shrub /early successional bird breeding species. Site investigations will determine whether shrub/early successional bird breeding habitat is present in or within 120m of the Project Location.

Terrestrial Crayfish

Meadow marshes and edges of shallow marshes are considered habitat for terrestrial crayfish. Site investigations will determine whether terrestrial crayfish are present in or within 120m of the Project Location.

3.2.3.4 Species of Conservation Concern

Special Concern and Rare Wildlife 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 NHIC Biodiversity Explorer, consultation with MNR and wildlife atlases were used to identify historic records of special concern and rare wildlife species that have occurred in the Study Area. Special concern and rare wildlife species are those that are listed as special concern and provincially rare (S1-S3, SH) plant and animal species (see Table 3.2, Appendix B). Endangered and threatened species listed as federally endangered or threatened with no provincial ESA protection are also listed in this category. Site investigations will include habitat suitability assessments for each these species, and will be used to determine the potential for candidate significant wildlife habitat for rare species.

3.2.3.5 Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from breeding habitat to summer habitat. Movement corridors must be considered when breeding habitat is confirmed as significant wildlife habitat. Corridors consist of native vegetation, road-less area, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant. Corridors should be at least 200 m wide with gaps less than 20 m and if following riparian area with at least 15 m of vegetation on both sides of the waterway.

Within a primarily agricultural setting, wildlife species move freely between natural areas (MNR, 2000). Potential significant corridors include naturally vegetated links between the largest natural areas within a municipality, the largest and oldest forest stands in a planning area, the largest and most diverse wetlands, relatively steep and undeveloped river valleys or riparian areas along lakes, rivers and streams, the most probable linkages between winter deer yards and amphibian breeding ponds, unopened road and rail allowances or utility corridors, and hedgerows, windbreaks and old fields that connect natural features (MNR, 2000). Significant corridors generally will be wider, without roads and structurally and compositionally diverse. Though fence and hedgerows may be considered animal movement corridors, they should not

be considered significant unless they provide the only corridor in the planning area (MNR, 2000).

No known animal movement corridors were identified in the Study Area. Site investigations will be conducted to assess the suitability of features as potential amphibian movement corridors.

3.2.4 Areas of Natural and Scientific Interest

ANSIs are defined as areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education (MNR, 2010). ANSIs are identified on the basis of scientific surveys of the province's ecodistricts and represent important natural features that are not found in provincial parks and conservation reserves. The MNR is responsible for identifying and evaluating the significance of ANSIs across the Province.

The two types of ANSIs include Life Science and Earth Science ANSIs (MNR, 2010), which can be evaluated as being provincially, regionally or locally significant. Life science ANSIs are significant representative segments of Ontario's biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments (MNR, 2010). Earth science ANSIs are geological in nature, consist of some of the most significant representative examples of the bedrock, fossils and landforms in Ontario, and include examples of ongoing geological processes (MNR, 2010).

3.2.4.1 Life Science ANSIs

Based on the information obtained from the MNR, through the NHIC, LIO mapping and agency correspondence, one provincially significant, and three regionally significant Life Science ANSIs have been identified in or within 120m of the Project Location.

- *South St. Ann's Slough Forest Provincially Significant Life Science ANSI* – Consists of extensive private intra-cropland woodland complex with well-developed clay plain ridge and slough basin landforms. The vegetation is generally disturbed by cutting and local development. Other communities present include deciduous upland and swamp forests, scrub and marsh slough zones. No significant biota has been recorded from this area.
- *Mountain View-Valentine Escarpment Terrace Regionally Significant Life Science ANSI* – This ANSI is situated on a prominent escarpment bedrock plain, with escarpment slopes of 20m in height extending for 2km. Vegetation communities include young to intermediate aged deciduous forests of varying composition. Some older forests occur on the talus slopes and deeper soils of the terrace and valley. No recent logging activity has been observed, although the spread of Garlic Mustard is notable in the deeper terrace soils.

- *Spring Forest Creek Regionally Significant Life Science ANSI* – Situated on a gently undulating sand and clay plain on a calcareous rockland with scarp exposure. Vegetation communities are diverse and of intermediate to mature ages; community types include deciduous upland and swamp forests and scrubland. Flora significant to the district are present.
- *North Bismark Regionally Significant Life Science ANSI* - Comprised of 60ha of private woodlot on a moderately rolling clay plain with a well-developed slough/rise landforms. Vegetation communities present include young aged deciduous upland and lowland forest and slough zone communities. This area has been subject to heavy logging.

3.2.4.2 Earth Science ANSIs

Based on the information obtained from the MNR, through the NHIC, LIO mapping and agency correspondence one provincially significant Earth Science ANSI has been identified in or within 50 m of the Project Location.

- *Winger Provincially Significant Earth Science ANSI* – The sand dunes here are relicts formed on an unnamed Late Wisconsonian, Port Huron Stadiallake by postglacial westerly and northwesterly winds. This area is an example of characteristic and relatively undisturbed parabolic and longitudinal dunes, typical of this part of Ontario.

3.2.5 Natural Features in Provincial Plan Areas

A portion of the transmission line is located within the Protected Countryside of the *Greenbelt Plan*. Based on ELC information obtained from the NPCA, there are no sand barrens, savannah, tallgrass prairie or alvar communities in or within 120 m of the Project Location. Such features are not specifically identified in the Greenbelt Plan (MMAH, 2005). Other natural features within the Greenbelt are covered under previous sections of this report.

The Project is not located within the Oak Ridges Moraine Conservation Plan Area.

Although not specifically addressed in the NHA, in accordance with O. Reg. 359/09, a portion of the transmission line is located within the Niagara Escarpment Plan Area. The construction of this project component will be reviewed and discussed with the NEC and a Development Permit obtained from the NEC prior to submission of the REA application to the MOE.

3.2.6 Provincial Parks and Conservation Reserves

There were no provincial parks or conservation reserves identified in the Study Area through the records review (MNR, 2011; NHIC, 2011; Ontario Parks, 2010). The closest Provincial Parks are Rock Point Provincial Park southwest of the Study Area and Short Hills Provincial Park northeast of the Study Area. This will not be carried forward through to site investigation.

3.3 SUMMARY

Table 3.1 provides a summary of the natural features that will be carried forward to site investigation.

Table 3.1 Natural Features Carried Forward to Site Investigation

Feature	Carried Forward to Site Investigation (Y/N)	Known Recorded Information
Wetlands	Y	154 wetlands in 16 provincially significant wetland (PSW) complexes and 4 locally significant wetland (LSW) complexes identified within 120m of the Project Location and 9 in the Project Location 803 pockets of unevaluated wetland identified in and within 120m of the Project Location; 790 wetlands within 120m of the Project Location and 13 wetlands in the Project Location for a total of 803
Woodlands	Y	265 woodlands identified within 120m of the Project Location and 12 woodlands in the Project Location
Wildlife Habitat		
Seasonal Concentration Area		
• Deer winter congregation areas	Y	118features identified by MNR as deer winter congregation areas within 120m of the Project Location and 14 in the Project Location.
• Colonial bird nesting sites (bank and cliff) • Colonial bird nesting sites (tree/shrub) • Colonial bird nesting sites (ground)	Y	• Beaver Creek Wetland; • Chippawa Creek Conservation Area Wetland; • Fifteen Mile Creek Above Escarpment Wetland; • Highway 20 and 24 Woodlots Wetland; • Marshville Station Clay Plain Wetland; • Moulton East Wetland; • Moulton West Wetland; • Old Welland Feeder Canal Wetland; • Silverdale Wetland; • St. Ann's North Woodlots Wetland; and • Welland River West Complex
• Waterfowl stopover and staging areas (terrestrial) • Waterfowl stopover and staging areas (aquatic)	Y	None known, will verify during site investigation.
• Shorebird migratory stopover areas	Y	
• Landbird migratory stopover areas	Y	
• Raptor wintering areas	Y	
• Bat hibernacula	Y	

Table 3.1 Natural Features Carried Forward to Site Investigation

Feature	Carried Forward to Site Investigation (Y/N)	Known Recorded Information
• Bat maternity colonies	Y	
• Bat migratory stopover areas	N	
• Turtle wintering areas	Y	
• Snake hibernaculum	Y	
• Migratory butterfly stopover areas	Y	
Rare Vegetation Communities or Specialized Habitat for Wildlife		
Rare Vegetation Communities	Y	The Natural Areas Inventory (NPCA, 2010) identified 19 regionally rare (RR) vegetation communities as possibly occurring in and within 120m of the Project Location.
• Cliffs and talus slopes • Sand barren • Alvar • Old growth forests • Savannah • Tallgrass prairie • Other rare vegetation communities listed in Appendix M of the SWHTG and the NHIC Biodiversity Explorer	Y	27 different rare community types have been identified within Appendix M of the SWHTG (2000) for Niagara and Haldimand-Norfolk as possibly occurring in and within 120m of the Project Location.
Specialized Habitat for Wildlife		
• Waterfowl nesting area	Y	Upper 16 Mile Creek and Headwaters of Big Forks Creek Wetland Complex wetland evaluation records.
• Bald Eagle and Osprey nesting, foraging, and perching habitat; • Woodland raptor nesting habitat;	Y	Known Bald Eagle nest greater than 1km from the Study Area along the Grand River.
• Turtle nesting habitat;	Y	MNR wetland evaluation records
• Seeps and springs.	Y	
• Amphibian breeding habitat (woodland) • Amphibian breeding habitat (wetland)	Y	
Habitat for Species of Conservation Concern		
• Marsh Bird Breeding Habitat	Y	
• Bird Breeding Habitat (woodland area-sensitive) • Bird Breeding Habitat (open country) • Bird Breeding Habitat (shrub/early successional)	Y	
• Terrestrial Crayfish	Y	
• Special Concern and Rare Wildlife	Y	68 rare vegetation species, 1 amphibian species,

Table 3.1 Natural Features Carried Forward to Site Investigation

Feature	Carried Forward to Site Investigation (Y/N)	Known Recorded Information
Species		11 birds, 4 reptiles, 9 insects and 4 mammals identified as possibly occurring in and within the Project Location
Animal Movement Corridors		No records
• Amphibian Movement	Y	
Areas of Natural and Scientific Interest (ANSI) • Life Science ANSI • Earth Science ANSI	Y	1 provincially significant and 3 regionally significant Life Science ANSIs within 120m of the Project Location 1 provincially significant Earth Science ANSI within the Project Location
Provincial Plan Areas	Y	Transmission line located in the Niagara Escarpment Plan Area and the Greenbelt Plan Area.
Provincial Parks and Conservation Reserves	N	None present in the Study Area

4.0 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, 2011).

Site investigations in support of this report were completed with the purpose of confirming the presence, boundaries, type, attributes, composition, and function of the natural features identified through the records review and identifying any additional features not previously identified. 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 that were identified in and within 120m of the Project Location through the records review.

Natural features that have the potential to occur in or within 120m of the Project Location, as identified through the records review, are listed in **Table 3.1**. Site investigations are required to confirm the presence and delineate the boundaries of all natural features in and within 120m of the Project Location as well as identify additional features.

4.1 METHODS

The site investigations undertaken detail the current conditions in and within 120m 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. As the layout of Project components evolved through the iterative design process, site investigations were undertaken to ensure complete coverage of the Zone of Investigation for this Project. Field surveys completed to assess the significance of natural features, including surveys to determine species use, presence/absence or concentrations of wildlife in the natural features identified during the site investigations, are described in Section 5.1.

Survey dates, times, duration, field personnel and weather conditions are presented in **Table 4.1, Appendix B**. All surveys conducted in and within 120m of the Project Location were completed by qualified personnel. *Curricula vitae* for personnel involved in conducting the site investigations are provided in **Appendix E.**

Land access was available for all land parcels where Project components are proposed. Areas in and within 120m of the Project Location were traversed on foot during site investigations. Alternative site investigations, comprised of visual scans from roadsides and/or property boundaries in combination with air photos, were undertaken in locations in and within 120m of the Project Location where access was not available and are discussed further in **Section 4.1.8**.

All site investigations were carried out in accordance with O. Reg. 359/09 and the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011b), using guidance provided in the *SWHTG*(MNR, 2000) and the Draft SWH Ecoregion 7E Criterion Schedule (MNR, 2012).

4.1.1 Vegetation Community and Vascular Plants Assessment

Ecological Land Classification (ELC) and botanical inventories of the vegetation communities in and within 120m of the Project Location were conducted over various seasons between September 2011 and October 2012. Survey dates, times, weather conditions and field personnel are summarized in **Table 4.1, Appendix B**.

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 and species at risk identified through the records review with historical occurrences within the Niagara Region.

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.

4.1.2 Woodland Assessment

The presence and boundaries of all woodlands that occur, or partially occur, in or within 120m of the Project Location were delineated through aerial photo interpretation and verified during ELC surveys (see Section 4.1.1).

Treed areas identified during vegetation surveys were compared to the definition of woodlands provided in O.Reg. 359/09 and the NHA Guide (MNR, 2011) to delineate the limits of "woodlands". A woodland is considered as a treed area, woodlot or forested area, other than a cultivated orchard or Christmas tree plantation. In determining the boundaries of woodland, openings of 20 m or less between crown edges (including public roads, railways etc.) were not considered to divide the woodland into two features (MNR, 2011a).

Information regarding ecological functions, attributes and uncommon characteristics was also collected during field surveys. Tree height, estimated stand age, presence of large and mature trees, snags, cavities, stick nests, disturbance, and specialized habitat features such as seeps, springs and vernal pools were recorded and detailed if present

4.1.3 Wetland Confirmation and Delineation

Wetlands in and within 120m of the Project Location identified during the course of the site investigations were delineated during the vegetation community assessment and vascular plant surveys in 2011 and 2012, as described in **Table 4.1**, **Appendix B**. Soil types and conditions were examined during the site investigations and wetland boundaries were determined using the extent of the ELC Community. The wetland boundaries were mapped through air photo interpretation and observations made during the site investigations in accordance with the methods outlined in the Ontario Wetland Evaluation System (OWES) Southern Manual (MNR, 2002). Boundaries of wetlands identified during the records review were revised based on observations by OWES trained staff using the 50% rule during the site investigations. As per OWES, Wetlands less than or equal to 0.5 ha were excluded unless they were contiguous with other wetland communities or connected hydrologically.

4.1.4 Wildlife and Wildlife Habitat

Site investigations to determine the presence of candidate significant wildlife habitat were conducted in 2011 and 2012, as described in **Table 4.1**, **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 120m of the Project Location. Criteria used to identify candidate significant wildlife habitat were derived from the Draft SWH Ecoregion 7E 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 120m of the Project Location.

4.1.4.1 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 Draft Significant Wildlife Habitat: Ecoregion 7E Criteria Schedules (OMNR 2012). The habitat criteria for each potential seasonal concentration area, and methods employed to identify them in and within 120m of the Project Location, have been summarized in **Table 4.1**.

Table 4.1 Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
Deer winter congregation areas	• Woodlands greater than 100 ha.	• Deer winter congregation areas in and within 120m of the Project Location as identified and delineated by MNR were used for the purposes of this assessment • The boundaries of the deer winter congregation areas were refined to correspond to the woodland features as identified during site investigations.
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: Cultural Meadow (CUM), Cultural Thicket (CUT). • A 100-300m radius buffer around habitat has been considered the candidate SWH. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless used by Tundra Swans in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas.	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats. • 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). • Surveys included looking for the presence of sheet water/spring flooding.
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 supply (mostly aquatic invertebrates and vegetation in shallow water) • The combined area of the ELC ecosites and a 100m 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.	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats. • ELC surveys and GIS analysis of the landscape were used to identify large wetlands or marshes with a diversity of vegetation communities interspersed with open water (aquatic staging areas). • Wildlife habitat assessment surveys conducted during fall and spring migration documented waterfowl flock locations and sizes in wetland habitats within 120m of the Project Location.
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	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats. • The presence of shorebird migratory stopover areas within suitable ELC communities was assessed.

Table 4.1 Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	habitat.	
LandbirdMigratory Stopover Area	• Presence of woodlots greater than 5 ha in size within 5 km of Lake Erie	• Vegetation community classifications and GIS analysis were utilized to assess features in and within 120m of the Project Location that meet the criteria to support a landbird migratory stopover area.
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 >20ha 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 15ha of the 20ha minimum size.	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would meet the habitat criteria to support a winter raptor wintering area
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).	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats. • Specialized site investigations were conducted to identify potential bat hibernacula, specifically potential caves along Niagara Escarpment). • A search for Karst feature and mines found in and within 120m of the Project Location was conducted with data obtained through the 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), that have>10/ha wildlife trees	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats. • Criteria from the OMNR Bat and Bat

Table 4.1 Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	>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). • Maternity roosts are not found in caves and mines in Ontario. • 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.	Habitats- Guidelines for Wind Power Projects were used to identify potential bat maternity roosts in the field. • Candidate bat maternity habitat will be determined by figuring out what the density of snags/cavity tree is in the woodland. This will done by using randomly selected plots, with a 12.6 m radius, as described in *Bats and Bat Habitats* (MNR 2011b),throughout the applicable habitat. A minimum of10 plots for woodlands 10 ha or less in size is required. An additional plot is required in larger woodlands for each hectare over 10ha, up to a maximum of 35 plots. • If snag/ cavity tree density is ≥10 snags per hectare of trees ≥25 cm dbh, then the site is a candidate for maternity colony roosts and EOS exit surveys are required.
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 in and within 120m of the Project Location that would support seasonal concentration habitats. • Site investigations were conducted to determine whether the above features contained permanent water deep enough not to freeze, with soft, muddy substrates
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	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats. • Specialized site investigations were conducted to identify potential snake hibernacula. Surveys for snakes and associated hibernacula features were conducted along edges of natural feature communities and hedgerows. • Habitat features that would provide an

Table 4.1 Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	underground route, act as a potential hibernacula including exposed rock 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 (ME), Thicket (TH), Savannah (SV), Bluff (BL), Cliff (CL). • A colony identified as SWH will include a 50m 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 in and within 120m of the Project Location that would support seasonal concentration habitats. • Cliffs and hills with exposed substrate(including river banks) within meadow, thicket and savannah habitats, were 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 (FET1). • The edge of the colony and a minimum 300m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0ha 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 in and within 120m of the Project Location that would support seasonal concentration habitats. • Large areas of marsh or swamp habitat with live or an abundance of dead trees, in and within 120m of the Project Location were searched for the presence of large stick nests to assess the presence of colonially-nesting bird species within suitable ELC communities.
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 (MAM), Shallow Marsh (MAS), Cultural Meadow (CUM), Cultural Thicket (CUT), Cultural 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	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats.

Table 4.1 Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	ditches within farmlands. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH.	
Migratory butterfly stopover areas	• A minimum of 10 ha in size with a combination of field and forest habitat within 5 km of Lake Ontario and Lake Erie. • Habitat should not be disturbed with an abundance of nectar plants and woodland edges.	• Vegetation community classifications were utilized to assess features in and within 120m of the Project Location that would support seasonal concentration habitats.

4.1.4.2 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 Draft Significant Wildlife Habitat: Ecoregion 7E Criteria Schedules (OMNR 2012). The habitat criteria for each potential rare vegetation community and candidate specialized wildlife habitat, and methods employed to identify them in and within 120m of the Project Location, has been summarized in **Table 4.2**.

Table 4.2 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 >3m 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	• The location of rare vegetation communities in and within 120m of the Project Location was based on data from the NPCA. • Vegetation community classifications and botanical inventories were also

Table 4.2 Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	• Most cliff and talus slopes occur along the Niagara Escarpment	used to assess the presence of rare vegetation communities in and within 120m of the Project Location.
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). • Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). 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.	• Vegetation community classifications and botanical inventories were used to assess the presence of rare vegetation communities in and within 120m of the Project Location.
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 plant. • Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and	• Vegetation community classifications and botanical inventories were used to assess the presence of rare vegetation communities in and within 120m of the Project Location.

Table 4.2 Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	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) • An Alvar site > 0.5 ha in size • Alvar is particularly rare in ecoregion 7E 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 in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest)	• Vegetation community classifications and botanical inventories were used to assess the presence of rare vegetation communities in and within 120m of the Project Location. • Forests greater than 140 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%. • Savannah was historically common in the near-shore areas of the Great Lakes. • In Ecoregion 7E, 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 Savanna Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savanna 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	• Vegetation community classifications and botanical inventories were used to assess the presence of rare vegetation communities in and within 120m of the Project Location.

Table 4.2 Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
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) was historically common in the near-shore areas of the Great Lakes • In ecoregion 7E, 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	• Vegetation community classifications and botanical inventories were used to assess the presence of rare vegetation communities in and within 120m of the Project Location.
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 of the Significant Wildlife Habitat Technical Guide • The OMNR/NHIC will have up to date listing for rare vegetation communities.	• Vegetation community classifications and botanical inventories were used to assess the presence of rare vegetation communities in and within 120m of the Project Location.
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, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 • Note: includes adjacency to Provincially Significant Wetlands	• The results of vegetation community classifications and GIS analysis of the landscape were used to identify large upland areas of open habitat that occurred adjacent to a large marsh, pond, swamp or swamp thicket communities or clusters of these vegetation communities in and within 120m of the Project Location.

Table 4.2 Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
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 assessment of habitat in FOD, FOM, FOC, SWD, SWM and SMC communities adjacent to riparian areas were conducted during vegetation wildlife habitat assessment surveys in the fall of 2011 and spring 2012 in and within 120m of the Project Location.
Woodland Raptor Nesting Habitat	• All natural or conifer plantation woodland/forest stands combined >30ha or with >4 ha of interior habitat. Interior habitat determined with a 200m 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	• Vegetation community classifications and size analysis completed to assess whether woodland/forested stands >30ha or with >4ha of interior habitat exist in and within 120m of the Project Location. • Surveys to identify the presence of stick nests during leaf off (Nov-March) including walking surveys of the woodlands and driving main roads using binoculars.
Turtle Nesting Areas	• Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1 • Best nesting habitat for turtles are close to water and away from roads and sites 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	• The results of vegetation community classification and wildlife habitat assessment surveys were used to identify watercourses and any marshy wetlands with open water that occurred in and within 120m of the Project Location. • Field staff searched for exposed sand or gravel <100mfrom MAM1,MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1 and FEO1 communities containing or in close proximity to open water and watercourses and away from roads.

Table 4.2 Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	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	• The presence of seeps and springs was recorded during wildlife habitat assessments and vegetation community delineation. The search for seeps or springs focused on woodlands in and within 120m 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 120m) 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 in and within 120m of the Project Location (woodland) were assessed 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 >120m from woodland habitats. • Wetlands and pools (including vernal pools) >500m^2 (about 25m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important	• Vegetation community classification surveys were used to identify habitat features in and within 120m of the Project Location including those that may support bullfrogs (i.e., natural open aquatic and marsh habitats).

Table 4.2 Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitat

Candidate Specialized Wildlife Habitat	Criteria	Methods
	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.	

4.1.4.3 Species of Conservation Concern

Habitats in and within 120m 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 Project Location (**Table 3.2, 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);
- Terrestrial crayfish; and
- Special Concern and rare wildlife species (as shown on **Table 3.2, Appendix B**).

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 7E Criterion Schedule. Additional survey information for specific categories is discussed in **Table 4.3**.

Table 4.3 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: SW (Swamp), MA (Marsh) and Meadow (ME) Community Types.	• Site investigations were conducted to assess the potential for this habitat using ELC to delineate previously unidentified wetland communities in and within 120m of the Project Location.
Woodland Area-sensitive Bird Breeding Habitat	• Habitats where interior forest (at least 200m 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 >30ha with a minimum interior of 4ha.	• Woodlots in and within 120m of the Project Location that were greater than 30ha in size, with adequate interior habitat and considered to have the potential to host populations of area sensitive species. • Site investigations were conducted to assess the potential for these woodlots to support area sensitive species through the delineation and verification of forest communities by ELC.
Open Country Bird Breeding Habitat	• Grassland areas > 30ha, 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: Cultural 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)	• Site investigations were conducted to assess the potential for grassland communities in and within 120m of the Project Location to support area sensitive species through the delineation and verification of grassland communities by ELC

Table 4.3 Characteristics Used to Identify Candidate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods
Shrub/Early Successional Bird Breeding Habitat	• Oldfield areas succeeding to shrub and thicket habitats >10ha, 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: Cultural Thickets (CUT), Cultural Savannahs (CUS) and Cultural Woodlands (CUW). +	• Site investigations were conducted to identify the presence for this habitat type using ELC to delineate thicket, savannah and cultural woodland type communities in and within 120m of the Project Location.
Terrestrial Crayfish	• Area of ELC Ecosite polygon is the SWH. • MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3. • Meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish.	• Area searches occurred within suitable habitats (MAM and MAS) to look for terrestrial crayfish and chimneys, • These surveys were conducted during ELC mapping.
S1-S3, Special Concern and SH Species and Communities	• All Species Concern or provincially rare plant and animal species element occurrences within a 1 or 10km grid. • Any federally Endangered or Threatened plant or animal species with no provincial ESA protection 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 in and within 120m, of the Project Location as described in the Draft SWH Ecoregion 7E Criterion Schedule.

4.1.5 Animal Movement Corridors

A review of aerial photography indicated the presence of linear hedgerows in and within 120m of the Project Location that may serve as corridors for amphibian movement. ELC mapping and aerial photography were used to determine which of the hedgerows contained sufficient vegetation cover and connectivity to accommodate amphibian and other animal movement.

Amphibian movement corridors will be considered when amphibian movement breeding habitat (wetland) has been confirmed as significant wildlife habitat. ELC mapping and aerial photography will then be used to determine specific amphibian movement corridors.

4.1.6 Areas of Natural and Scientific Interest (ANSIs)

ANSIs are defined as areas with life or earth science values related to protection, scientific study or education. The Ontario Ministry of Natural Resources retains responsibility for

identifying the presence of ANSIs and delineating their boundaries. ANSIs, as identified and delineated by MNR, were used for the purposes of this assessment.

4.1.7 Specified Provincial Plan Areas

As described in Section 4.1.1, Ecological Land Classification (ELC) and botanical inventories of the vegetation communities in and within 120m of the Project Location were conducted over various seasons between September 2011 and October 2012. These surveys were used to assess the presence of sand barrens, savannah, tallgrass prairie or alvar communities in or within 120 m of the Project Location. All other natural features within the Greenbelt Plan Area were identified in accordance with the various methods described in Section 4.1.2 to 4.1.6.

4.1.8 Alternative Site Investigation Methods

In accordance with section 26(3)(7) of O. Reg. 359/09, alternative site investigations were conducted where it was not reasonable to conduct site specific investigations. As discussed in Section 4.1, land access was available for all land parcels where Project components are proposed. Site investigations were completed within the Zone of Investigation for all participating landowners and where access permission was available. However, where permission was not available to access adjacent properties, or where it was not deemed reasonable to complete a site investigation for other reasons, an alternative site investigation was completed. The areas where site investigations and alternative site investigations were completed are identified on **Figure 1.2**.

Site investigations were completed by physically accessing all properties within the Zone of Investigation where permission to do so was provided. However, any properties where access was not obtained were investigated through an alternative site investigation method. In all such cases, these methods included a combination of aerial photograph interpretation and visual observations in the field from the nearest property line, fence line or municipal right of way. Observations of vegetation, species, communities, wildlife, wildlife habitat features and structures were recorded.

The following situations necessitated the need for an alternative site investigation within the Zone of Investigation because it was not reasonable to physically access these properties:

a) Collector and transmission lines: Due to the large number of non-participating landowners along the 63.72 kmof transmission line and 179 km of collector lines (approximately 1208 properties), it was not deemed reasonable to contact each landowner to request and obtain access to their property.

   Since the proposed collector lines and transmission lines are restricted to the already-disturbed, existing road right-of-ways, roadside surveys were considered a sufficient level of effort to supplement air photo interpretation, confirm the records review information, identify additional natural features and describe existing conditions to an

appropriate level necessary to assess significance and potential impacts of the transmission and collector lines.

Of note, where collector and transmission lines occur on participating properties, or properties where access permission was granted, site investigations were completed for these areas.

b) Access permission specifically denied by landowner: Access to several properties within the Zone of Investigation was specifically denied by landowners. These situations were identified prior to undertaking the field investigations through private conversations between the Project Team and landowner. In these cases, property line or fence line surveys were completed (as described in the following sections).

c) Other non-participating landowners: In some cases, adjacent properties did not contain natural features that would necessitate the need for physically visiting the property to complete a site investigation. These cases included properties that did not contain a natural feature, such as residential properties or agricultural fields. Through an interpretation of aerial photographs and observations from the nearest property (fence) line, site characteristics and conditions were recorded to an appropriate level of detail to complete the NHA/EIS. Therefore, it was not deemed reasonable (or necessary) to access these properties.

4.2 RESULTS

The Project Location consisted almost entirely of actively managed and cultivated cropland, including primarily soybeans and corn, with occasional fields of alfalfa and hay. Adjacent to these fields were a mix of naturalized habitats, including isolated woodlands and wetlands that provide a variety of wildlife habitat functions. Natural vegetation consisted primarily of deciduous swamp, deciduous woodland and hedgerows and is described in **Section 4.2.1**.

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

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 4.2**, **Appendix B** and discussed in the following sections.

4.2.1 Vegetation Community and Vascular Plants Assessment

Delineated ELC communities, which provide the foundation for the identification of most natural features, are shown on **Figures 3.1 - 3.58, Appendix A.** A summary of the vegetation communities occurring within 120m of the Project Location, as identified by field investigations, is provided in **Table 4.3, Appendix B**. **Table 4.4, Appendix B** provides detailed descriptions of each vegetation community occurring within 120m of turbines and access roads, while **Table 4.5**, **Appendix B** provides detailed descriptions of vegetation communities found within

120m of roadside collector lines and the transmission line. Field notes for the site investigations are provided in **Appendix F**.

Three hundred and seventy-eight (378) vascular plant species were recorded during the vegetation assessments. Of that number, 285 species (75%) are native and 93 species (25%) are exotic. Most of the native plant species (87%) are ranked S5 (secure), while 11% are ranked S4 (apparently secure) and 2% are ranked S1-S3. Twenty five (25) regionally rare species were observed. A complete list of vascular plant species recorded is provided in **Appendix G**.

4.2.2 Wetlands

Wetlands in and within 120m of the Project Location were typically swamp maple, green ash or bur oak mineral swamps with scattered meadow marshes and swamp thickets. Descriptions of these features can be found in **Table 4.6 Appendix B** with ELC community descriptions found in **Appendix F** and shown on **Figures 3.1 - 3.58, Appendix A.**

Site investigations confirmed that 157 wetland features greater than 0.5 ha in size are found in and within 120m of the Project Location. Wetlands less than or equal to 0.5 ha were complexed with adjacent wetland units where applicable. Collector lines are proposed to be directionally drilledbeneath10of the wetland features (we100, we234, we240, we286, we292, we317, we402 we403, we407 and we423) on private property, the design of which was intentional to avoid having project components in, on or over a wetland. Alternatively, a collector and transmission line is being considered over the Welland River (we423) and a collector line over the Welland Feeder Canal (we407).

Of note, a conservative approach to identifying wetlands within the transmission line and collector line corridor was undertaken. Wetlands identified by NPCA, GRCA and MNR in the background review and identified by Stantec as deciduous forest (FOD) communities were assumed to be wetland, as detailed inventories of these complex communities and delineation of wetlands under OWES were not possible as property access was not available.

4.2.2.1 Provincially Significant Wetlands

Site investigations confirmed the presence of 88PSW features as part of the 16 identified Provincially Significant Wetland Complexes within 120m of the Project Location. The wetland boundaries and the Project Location in relation to the boundaries are shown on **Figures 4.1 – 4.58, Appendix A**.

Type, attributes, composition and functions of the wetlands are described in **Table 4.6, Appendix B.**

Site investigations confirmed that corrections were required to the boundaries of the following wetland complexes:

- St. Ann's Slough Forest Wetland Complex (we97)
- Bismark North West Slough Forest Wetland Complex (we229)
- Upper Beaver Creek Wetland Complex (we349, we332)
- Beaver Creek Wetland Complex (we303)
- Silverdale Wetland Complex (we299)
- Port Davidson Slough Forest Wetland Complex (we440)
- Chippawa Creek Slough Forest Wetland Complex (we458, we467)
- Moulton West PSW (we522).

The PSW boundaries as verified during site investigations have been updated and MNR has been provided with the updated boundary information (digital information provided in conjunction with this report).

Corrections were required to the results of the record review as a result of the site investigation (**Table 4.2, Appendix B**).

4.2.2.2 Locally Significant Wetlands

Site investigations confirmed the presence of five(5) locally significant wetland features that are part of the four (4) locally significant wetland complexes within 120m of the Project Location. The wetland boundaries and the Project Location in relation to the boundaries are shown on **Figures 4.1 – 4.58, Appendix A.**

No corrections were required to the results of the record review as a result of the site investigation (**Table 3.2, Appendix B**).Type, attributes, composition and functions of the wetlands are described in **Table 4.6,Appendix B**.

4.2.2.3 Unevaluated Wetlands

Site investigations confirmed the presence of 64unevaluated wetland features greater than 0.5ha in size within 120m of the Project Location. No unevaluated wetlands were identified within the Project Location.

4.2.2.4 Additional Features

During the course of wetland site investigations, 20 additional unevaluated wetland features greater than 0.5ha not previously identified, were identified as occurring in and within 120m of the Project Location. The location and boundaries of these features as identified and delineated according to OWES protocol are identified on **Figures 4.1- 4.58, Appendix A**.

Corrections were required to the results of the record review as a result of the site investigation (**Table 3.2, Appendix B**).

4.2.3 Woodlands

The site investigation confirmed the presence of 215 woodland features. Site investigations confirmed that some of the woodlands are no longer present while others no longer meet the definition of a woodland. In some cases the boundaries of the woodland features have been modified where they are less than 20m from adjacent woodlands. Collector Lines are proposed to be directionally drilled beneath seven (7) of these woodlands (wo66, wo105, wo119, wo191, wo113, wo153 and wo194). These woodland features are shown in **Figures 5.1 – 5.58, Appendix A**.

The vegetation communities within each woodland are described in **Table 4.4**, **Appendix B** and are shown on **Figures 3.1 – 3.58, Appendix A**. A complete list of vascular plant species recorded in the Study Area is provided in **Appendix G**. **Table 4.7, Appendix B** provides a description of the attributes, composition and function for each of the woodlands identified as occurring in or within 120m of the Project Location based on the site investigations (vegetation and wildlife habitat assessment surveys) and GIS analysis of the landscape context.

4.2.3.1 Additional Features

During the course of site investigations, 55 unidentified woodland features were identified as occurring in or within 120m of the Project Location. These woodlands are included in the 215 woodland features identified above. The location and boundaries of these features are identified on **Figures 4.1- 4.58, Appendix A.**

Corrections were required to the results of the record review as a result of the site investigation (**Table 4.2, Appendix B**).

4.2.4 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 in the Draft Significant Wildlife Habitat Ecoregion 7E Criteria Schedule and the SWHTG (MNR, 2000) in order to determine whether natural communities in and within 120m of the Project Location support candidate or confirmed significant wildlife habitat. Features associated with candidate significant wildlife are identified in the following sections, and illustrated in **Figures 6.1 – 6.58, Appendix A.**

4.2.4.1 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 4.4**.

Table 4.4 Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Deer winter congregation areas	Yes	118 features located within 120m of the Project Location. Site investigations confirmed that corrections were required to the boundaries of 112 of the deer winter congregation areas.	Generalized
Waterfowl Stopover and Staging Area (Terrestrial)	No	Cultural thickets and meadows with significant spring melt water flooding or sheet water was absent within 120m of the project location.	No
Waterfowl Stopover and Staging Area (Aquatic)	No	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 (SWHTG, 2000). Marshes along Great Lakes shorelines are considered particularly valuable (SWHTG, 2000). Although the appropriate Ecosites are located within 120m of the Project Location, only those communities that contain standing water during Waterfowl Migration windows (March 1st – April 30th and October 1st – December 15th) were considered candidate SWH. No large open aquatic areas were identified in or within 120m of the Project Location during site investigations The habitat components required to support candidate significant wildlife habitat for waterfowl stopover and staging areas did not occur in or within 120m of the Project Location. Dunnville Marshes to the West and Wainfleet Bog to the East outside of the study area provide the best significant habitat in the vicinity of the Project.	No
Shorebird Migratory Stopover Area	No	Relatively undisturbed shorelines along lakes, rivers, and wetlands that produce abundant food (clams, insects, snails and worms) are used by shorebirds during migration (MNR, 2000). Site investigations determined that shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats were absent in and within 120m of the Project Location.	No
Landbird Migratory Stopover Area	Yes	Site investigations identified the presence of woodlots greater than 5 ha in size within 5 km of Lake Eriethat met the criteria as wildlife habitat for Landbird Migratory	Yes (mlsa1 – mlsa4)

Table 4.4 Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
		Stopover areas in the Study Area. Four (4) candidate significant wildlife habitat areas supporting Landbird Migratory Stopover Areas are present within 120m of the Project Location	
Raptor Wintering Area	Yes	Preliminary site investigations indicated the presence of candidate significant wildlife habitat for winter raptor feeding and roosting areas in the Study Area. Further investigation confirmed that eight (8)candidate significant wildlife habitat areas supporting raptor winter feeding and roosting are present in or within 120m of the Project Location. The habitats consisted ofa combination of fields, primarily hay fields, and woodlands that provide roosting, foraging and resting habitats for wintering raptors.	Yes (wr1 – wr8)
Bat Hibernacula	No	There are no caves, abandoned mine shafts, underground foundations, and Karsts or crevice/cave communities in or within 120m of the project location. One possible hibernacula was identified in the CLO1 feature in the Mountainview Conservation Area within 120m of the Transmission line corridor. A detailed assessment of this feature confirmed that it did not meet the criteria for SWH and is greater than 120m from a turbine.	No
Bat Maternity Colonies	Unconfirmed	Habitat assessment surveys were undertaken in bmc5, bmc21, bmc22, bmc40, bmc41.These features are all <0.5 ha in size and were walked in their entirety during leaf off (Oct-Nov) in 2011 looking for snags and cavities. None of these communities met the criteria for candidate significant wildlife habitat for bat maternity coloniesof snag/ cavity tree density ≥10 snags per hectare of trees ≥25 cm dbh, ELC surveys identified an additional 48 FOD communities within 120m of turbines that met the criteria for possible candidate significant wildlife habitats for bat maternity colonies Pre-construction site investigations are required in these communities to determine if they meet the criteria for candidate significant wildlife habitat for bat maternity colonies.	Yes (bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55).

Table 4.4 Summary of Site Investigation Results for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Turtle Wintering Areas	Yes	Vegetation classification surveys identified the presence of wetland areas within 120m of the Project Location consisting primarily of swamp maple and green ash deciduous swamps with scattered meadow marshes and swamp thickets. The Welland River has been identified as candidate significant wildlife habitat for turtle overwintering.	Yes (twa1)
Snake Hibernacula	Yes	Snake hibernacula features such as buried concrete or rock (e.g. building foundations, culverts, rock crevices or abandoned animal burrows) were found within 120m of the Project Location. During site investigations, 6 candidate habitats for hibernacula sites were identified 1 habitat feature isolated within 120m of a collector line considered to be a component with no operational impacts and will be considered Generalized Candidate Significant Wildlife Habitat. .	Yes (sh2, sh3 sh4, sh6, sh7) Generalized (sh5)
Colonial-Nesting Bird Breeding Habitat (bank/cliff)	No	Results of the vegetation community surveys determined that there no eroding banks, sandy hills, borrow pits, steep slopes and sand piles present in or within 120m of the Project Location.	No
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	No	Woodlands containing deciduous treed swamp inclusions were present in or within 120m of the project location; however, none of these sites had nests to demonstrate this habitat is used by colonial-nesting birds.	No
Colonial-Nesting Bird Breeding Habitat (ground)	No	There are no lakes or large rivers providing shoreline habitat or containing rocky island or peninsula features within 120m of the project location. Brewer's Blackbird has only been recorded from two locations in the extreme southwestern corner of Ecoregion 7E and is not known to occur within the Project Location (Cadman et al, 2007).	No
Migratory butterfly stopover areas	No	No habitat a minimum of 10 ha in size with a combination of field and forest habitat was found in and within the Project location within 5 km of Lake Erie.	No

4.2.4.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

Site investigation results pertaining to rare vegetation communities and specialized habitats in and within 120m of the Project Location are summarized in **Table 4.5**. 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 4.5 Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
Cliffs and Talus Slopes	Yes	Two rare vegetation communities (CLO1 and TAT1-7*) within 120m of the Transmission Line were observed during site investigations. Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.	Generalized
Sand Barrens	No	Rare vegetation communities (sand barrens) were not observed during vegetation surveys and woodland assessment of all woodlands in or within 120m of the Project Location.	No
Alvars	No	Rare vegetation communities (alvars) were not observed during vegetation surveys and woodland assessment of all woodlands in or within 120m of the Project Location.	No
Old-growth Forest	No	Rare vegetation communities (old growth forest) were not observed during vegetation surveys and woodland assessment of all woodlands in and within 120m of the Project Location. ELC surveys and woodland assessments of all woodlands within 120m of the Project Location did not contain suitable habitat to old-growth forests. All mature woodlands within 120m of the Project Location contained historical forestry management. No candidate significant wildlife habitat was present in or within 120m of the Project Location for old-growth forests.	No
Savannahs	No	Rare vegetation communities (savannahs) were not observed during vegetation surveys and woodland	No

Table 4.5 Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
		assessment of all woodlands in and within 120m of the Project Location.	
Tall-grass Prairies	No	Rare vegetation communities (tall-grass prairie) were not observed during vegetation surveys and woodland assessment of all woodlands within 120m of the Project Location.	No
Other Rare Vegetation Communities	Yes	Rare vegetation communities were observed during vegetation surveys and woodland assessment of all woodlands within 120m of the Project Location. Descriptions of these features are found in **Table 4.8, Appendix B.** Those communities within 120m of project components with no operational impacts (Collector lines, Transmission lines and turbines) will be considered Generalized Candidate Significant Wildlife Habitat.	Yes (rv2 and rv3) Generalized (rv1, rv4, rv6 and rv7)
Waterfowl Nesting Area	No	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 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. Site investigations indicated that wetlands within 120m of the Project Location were comprised primarily of deciduous swamps, lacking large cavity trees suitable for cavity nesting waterfowl (e.g., Wood Duck) and lacking standing water, or small mineral marsh communities. Upland areas adjacent to these features are typically small and fragmented while ponds are limited to agricultural fields.	No
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	No	ELC and habitat assessments of all woodlands and vegetated watercourses in or within 120m of the Project Location did not detect any specialized nesting habitat or nests for Osprey and Bald	No

Table 4.5 Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
		Eagle. No Bald Eagle nests are known to occur within 920 m of the Project Location. No Osprey nests are known to occur within 420m of the Project Location. No candidate significant wildlife habitat was present within 120m of the Project Location for bald eagle and osprey nesting, foraging and perching habitat.	
Woodland Raptor Nesting Habitat	Yes	There are 9 candidate significant wildlife habitats present within 120m of the Project Location for woodland raptor nesting habitat. They are each >30ha with >4ha of interior habitat based on a 200m buffer. Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.	Generalized (9)
Turtle Nesting Areas	Yes	ELC and habitat assessment surveys identified18 candidate significant wildlife habitats for turtle nesting within 120m of access roads. Habitat features within 120m of project components with no operational impacts (Collector lines, Transmission lines and turbines) will be considered Generalized Candidate Significant Wildlife Habitat.	Yes (th3, th5, th9, th10,th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69) Generalized (53)
Seeps and Springs	No	ELC and woodland habitat assessment surveys of all woodlands in and within 120m of the Project Location did not identify seeps or springs.	No
Amphibian Breeding Habitat (Woodland)	Yes	Site investigations to identify potential amphibian woodland breeding ponds in the fall of 2011, areas of standing water or areas which showed evidence of holding water through the spring (based on topography and vegetation) were assessed. Size of pools, presence and depth of standing water, surrounding vegetation community, emergent and submergent vegetation and canopy cover were recorded. As a result,	Yes (68) Generalized (513)

Table 4.5 Summary of Site Investigation Results for Rare Vegetation Communities and Specialized Wildlife Habitat

Candidate Rare Vegetation Community/Specialized Wildlife Habitat	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EOS (Y/N)
		68candidate amphibian woodland habitat features were identified in and within 120m of the Project Location. Descriptions of these features are found in **Table 4.9, Appendix B.** Those habitat features within 120m of project components with no operational impacts (Collector lines, Transmission lines and turbines) will be considered Generalized Candidate Significant Wildlife Habitat.	
Amphibian Breeding Habitat (Wetland)	Yes	As a result of site investigations, 18 candidate amphibian wetland habitat features were identified in and within 120m of the Project Location. Descriptions of wetland areas located more than 120m away from woodland habitats found in **Table 4.10, Appendix B.** Those habitat features within 120m of project components with no operational impacts (Collector lines, Transmission lines and turbines) will be considered Generalized Candidate Significant Wildlife Habitat.	Yes (18)

4.2.4.3 Species of Conservation Concern

Site investigation results pertaining habitats for species of conservation concern in or within 120m of the Project Location are summarized in **Table 4.6**. Species of wildlife concern that did not have any candidate significant wildlife habitat will not be carried forward to the evaluation of significance phase.

Table 4.6 Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to EOS (Y/N)
Marsh Bird Breeding Habitat	Yes	Two (2) marshland communities identified during site investigations will be investigated during the evaluation of significance for potential significant marsh bird breeding habitat (mbb1 and mbb2) and are shown on **Figures 6.35 and 6.55, Appendix A.** Although there are many MAM ecosites within 120m of the Project Location they did not have shallow standing water or emergent aquatic vegetation, and therefore do not provide potential nesting habitat for marsh breeding birds.	Yes (mbb1 – mbb2)
Woodland Area-sensitive Bird Breeding Habitat	Yes	9 candidate significant wildlife habitats were present within 120m of the Project Location for interior breeding bird habitat. They are each >30ha with >4ha of interior habitat. Because they are not within 120m of project components with the potential for operational impacts, they will be considered generalized candidate significant wildlife habitat.	Generalized
Open Country Bird Breeding Habitat	No	Site investigations confirmed that grassland habitat not associated with agriculture (e.g. Hayfields and cattlefields) exceeding 30 ha was absent in and within 120m of the Project Location. As such, no candidate significant wildlife habitat for area-sensitive grassland species was present in or within 120m of the Project Location.	No
Shrub/Early Successional Bird Breeding Habitat	No	No candidate significant wildlife habitats>10 ha were present in or within 120m of the Project Location for shrub/early successional bird breeding habitat	No
Terrestrial Crayfish	Yes	Site investigations confirmed 413 MAS and MAM communities which were candidate habitats for terrestrial crayfish.	Yes
Special Concern and Rare Wildlife Species	Yes	A search for potential habitat for Species of Special Concern and Rare Wildlife	Yes

Table 4.6 Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to EOS (Y/N)
(1 amphibian species, 11 birds, 4 reptiles, 9 insects and 4 mammals, as per **Table 3.2, Appendix B.**)		Species was performed during site investigations. Candidate significant wildlife habitat was identified for 4bird,3 reptile and 1 mammal species during site investigations. Rationale for each species is provided below. Details of the habitat requirements are found in **Table 3.2, Appendix B.**	
Plants	Yes	68 rare plant species were identified to potentially occur within the Project Location during the records review. Through site investigations, potential habitat was identified for 67 of these plant species in and within 120m of the Project Location. Details of the habitat requirements are found in **Table 3.2, Appendix B.** Complete ELC and vegetation surveys were conducted and two (2) rare plant species were observed as occurring within 120m of the Transmission Line; Honey Locust (S2) and Fullers Hawthorne (S2) were recorded within 120m of the Project Location	Yes (Generalized)
Bald Eagle	No	The Bald Eagle is designated as special concern provincially, and almost always nests near water, usually on large lakes. Large stick nests are placed in trees located within mature woodlots. They usually require 250 ha of mature forest for breeding, however, along Lake Erie, where the lake provides a valuable food source, the eagles will nest in smaller woodlots or even single trees (Sandilands, 2005). The Lake Erie shoreline is the predominant area for breeding Bald Eagles in southwestern Ontario (Cadman et al., 2007). As discussed in Section 3.1.6.2 (Bald Eagle and Osprey Nesting, Foraging and Perching habitat) no nests or perches for Bald Eagles were identified during site investigations. As such, no candidate significant wildlife habitat for Bald Eagle was present within 120m of the Project Location.	No

Table 4.6 Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to EOS (Y/N)
Short-eared Owl	Yes	Candidate SWH for this species has been determined through the consideration of winter raptor habitat in Section 4.2.5.3. and during site investigations. Seven (7) candidate significant wildlife habitat features were present in and within 120m of the Project Location. .	Yes (wr1-wr8)
White-eyed Vireo	No	Habitat for this species has been determined through the consideration of shrub successional breeding bird habitat in Section 4.2.5.3	No
Black Tern		Habitat for this species has been determined through the consideration of marsh breeding bird habitat in Section 4.2.5.3	No
Louisiana Waterthrush	Yes	Habitat for this species was determined within the context of Woodland Area-Sensitive Interior Forest Breeding Birds. Because they are not within 120m of project components with the potential for operational impacts, they will be considered generalized candidate significant wildlife habitat.	Generalized
Common Nighthawk	No	The Common Nighthawk is an aerial insectivore and forages at dawn and dusk. Common Nighthawks nest on the ground in open habitats preferably with rocky or graveled substrate. Nighthawks will even nest on gravel roofs in the city. The regeneration or succession of forest clearings and the destruction of grassland habitats appear to play a major role in this species' decline along with the non-selective spraying for mosquitoes (Cadman et al., 2007).No open ground or clearings within forested areas along rocky or graveled substrates were identified during site investigations. As such, no candidate significant wildlife habitat for Common Nighthawk was present within 120m of the Project Location.	No
Hooded Warbler	Yes	Habitat for this species was determined within the context of Interior Forest Breeding Birds. Because they are not within 120m of project components with the potential for operational impacts, they	Generalized

Table 4.6 Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to EOS (Y/N)
		will be considered generalized candidate significant wildlife habitat.	
Canada Warbler	Yes	Habitat for this species was determined within the context of Interior Forest Breeding Birds. Because they are not within 120m of project components with the potential for operational impacts, they will be considered generalized candidate significant wildlife habitat.	Generalized
Yellow-breasted Chat	No	Habitat for this species has been determined through the consideration of shrub successional breeding bird habitat in Section 4.2.5.3	No
Red-headed Woodpecker	Yes	The Red-headed Woodpecker occupies a wide range of habitats, but most are characterized by open areas for feeding; snags for roosting, and a secure food supply. This species requires multiple snags for nesting, roosting, and foraging. Some of the habitats used are: open deciduous and riparian woodlands, orchards, parks, agricultural lands, savanna-like grasslands, beaver ponds with snags, forest edges, burned forests, and flooded bottomland forests. (N.A.S., 2012) No habitat greater than 4ha providing cavity trees with at least 40dbh were identified within 120m of project components. As such, no candidate significant wildlife habitat for Red-headed Woodpecker was present within 120m of the Project Location.	No
Milksnake	Yes	Habitat for this species has been determined through the consideration of Snake Hibernacula (Section 4.2.5.1).	Yes (sh2, sh3, sh4, sh6, sh7) Generalized (sh5)
Snapping Turtle	Yes	Habitat for this species has been determined through the consideration of turtle wintering areas (Section 4.2.5.1) and turtle nesting habitat (Section 4.2.5.2).	Yes(th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69)

Table 4.6 Summary of Site Investigation Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to EOS (Y/N)
Eastern Ribbonsnake	Yes	Habitat for this species has been determined through the consideration of Snake Hibernacula (Section 4.2.5.1).	Yes (sh2, sh3 sh4, sh6, sh7) Generalized (sh5)
Lepidoptera	No	Two rare butterfly species were identified to potentially occur within the Study Area during the records review. Through air photo interpretation and site investigations, no potential candidate habitat was identified for the two rare butterfly species in or within 120m of the Project Location. Habitat for these species has been determined through the consideration of migratory stopover areas in Section 4.2.5.1	No
Woodland Vole	Yes	Habitat for this species was determined during site investigations and woodland habitat assessments. All habitat features are within 120m of project components with no operational impacts (Collector lines, Transmission lines, access roads and turbines) and will therefore be considered Generalized Candidate Significant Wildlife Habitat.	Generalized (234)
Small-footed Bat	Unconfirmed –suitable habitat exists.	Habitat for this species has been determined through the consideration of Bat hibernacula and Bat maternity colonies in section 4.2.5.1	Yes
Eastern Pipistrelle	Unconfirmed – suitable habitat exists.	Habitat for this species has been determined through the consideration of Bat hibernacula and Bat maternity colonies in section 4.2.5.1	Yes

4.2.4.4 Animal Movement Corridors

As indicated in the SWHTG (MNR, 2000), it is seldom possible to observe wildlife species using corridors. The records review process did not reveal any known animal movement corridors within 120m of the Project location. Available base mapping indicated that there were several linear features, including treed fencerows and naturalized drains, in and within 120m of the Project Location. Amphibian movement corridors should consist of native vegetation, with no road crossings, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant (OMNR, 2011). Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat – Wetland, which has been

identified. Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m 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).

4.2.5 Areas of Natural and Scientific Interest (ANSIs)

ANSIs are defined as areas with life or earth science values related to protection, scientific study or education. Four Life science ANSIs were identified within 120m of the Project Location; one Provincially Significant Life Science ANSI (South St. Ann's Slough Forest Provincially Significant Life Science ANSI) and three Regionally Significant Life Science ANSIs (Mountainview-Valentine Escarpment, Spring Forest Creek and North Bismark)

The Winger Provincially Significant Earth Science ANSI is found within the Project Location.

Boundaries of the ANSIs that extend in and within 120m of the Project Location are shown on **Figures 7.1 - 7.58, Appendix A.**

4.2.6 Provincial Plan Areas

A portion of the transmission line corridor has been identified as being within the Protected Countryside of the Greenbelt Plan Area as shown on **Figures 2.3 - 2.5, Appendix A**. However, no sand barrens, savannah, tallgrass prairie or alvar communities were observed in or within 120 m of the Project Location. Other natural features within the Greenbelt Plan Area have been covered under Sections 4.2.1 to 4.2.5.

For reference, the portion of the transmission line within the Niagara Escarpment Plan Area is shown on **Figures 2.2 - 2.3, Appendix A.**

4.3 SUMMARY

Table 4.7 provides a summary of the natural features that will be carried forward to the evaluation of significance.

Table 4.7 Natural Features Carried Forward to Evaluation of Significance

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Features to be Evaluated
Wetlands	Y	Y	64unevaluated wetlands
Woodlands	Y	Y	215 woodland features
Wildlife Habitat			
Seasonal Concentration Areas			
• Deer winter congregation areas	Y	Y	Generalized (118)
• Colonial bird nesting sites (bank	Y	N	None

Table 4.7 Natural Features Carried Forward to Evaluation of Significance

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Features to be Evaluated
and cliff) • Colonial bird nesting sites (tree/shrub) • Colonial bird nesting sites (ground)			
• Waterfowl stopover and staging areas (terrestrial) • Waterfowl stopover and staging areas (aquatic)	Y	N	None
• Shorebird migratory stopover areas	Y	N	None
• Landbird migratory stopover areas	Y	Y	Four (4)potential candidate significant wildlife habitat areas supporting Landbird Migratory Stopover Areas (mlsa1-mlsa4)
• Raptor wintering areas	Y	Y	Eight(8) potential candidate significant wildlife habitat areas supporting raptor winter feeding and roosting (wr1-wr8)
• Bat hibernacula	Y	Y	None
• Bat maternity colonies	Y	N	48potential candidate significant wildlife habitats for bat maternity colonies within 120m of turbines(bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55).
• Bat migratory stopover areas	Y	N	None
• Turtle wintering areas	Y	Y	One (1) potential candidate significant wildlife habitat supporting turtle overwintering (twa1)
• Snake hibernaculum	Y	Y	Five (5) potential candidate significant wildlife habitats supporting snake hibernaculum within 120m of the Project Location sh2, sh3, sh4,sh6 and sh7 Generalized (sh5)

Table 4.7 Natural Features Carried Forward to Evaluation of Significance

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Features to be Evaluated
• Migratory butterfly stopover areas	Y	N	None
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	Y (other Rare Vegetation Communities Only)	CLO1 and TAT1-7* communities considered Generalized Candidate Significant Wildlife Habitat Six (6) rare vegetation communities identified within 120m of the Project Location (rv1, rv3) Generalized (rv2, rv4, rv6, rv7)
Specialized Habitat for Wildlife			
• Waterfowl nesting area	Y	N	None
• Bald Eagle and Osprey nesting, foraging, and perching habitat	N	N	None
• Woodland raptor nesting habitat	Y	Y	Nine (9) woodland raptor nesting habitat features considered Generalized Candidate Significant Wildlife Habitat within 120m of the Project Location (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212).
• Turtle nesting habitat	Y	Y	18 candidate SWH features for turtle nesting habitat within 120m of the Project Location(th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69)
• Seeps and springs.	Y	N	None
• Amphibian breeding habitat (woodland) • Amphibian breeding habitat (wetland)	Y	Y	68 candidate SWH features for woodland amphibian habitat and 18 candidate SWH habitat features for wetland amphibian habitat in or

Table 4.7 Natural Features Carried Forward to Evaluation of Significance

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Features to be Evaluated
			within 120m of the Project Location
Habitat for Species of Conservation Concern			
• Marsh Bird Breeding Habitat	Y	Y	Two (2) candidate SWH features for marsh breeding birds within 120m of the Project Location (mbb1 and mbb2)
• Bird Breeding Habitat (woodland area-sensitive) • Bird Breeding Habitat (open country) • Bird Breeding Habitat (shrub/early successional)	Y	Y	Nine (9) candidate significant wildlife habitats for interior breeding bird habitat considered Generalized Candidate Significant Wildlife Habitat within 120m of the Project Location (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212). No Candidate significant wildlife habitat for shrub/early successional bird breeding birds or open country breeding birds occur within 120m of the Project Location
• Terrestrial Crayfish	Y	Y	413 habitat features considered Candidate Significant Wildlife Habitat
• Special Concern and Rare Wildlife Species	Y	Y	Candidate SWH for 67 rare plant species, Short-eared Owl, Milksnake, Eastern Ribbonsnake, Snapping Turtle, Woodland Vole, Small footed Bat, Eastern Pipistrelle, Louisiana Waterthrush, Hooded Warbler and Canada Warbler in and within 120m of the Project Location Generalized Candidate

Table 4.7 Natural Features Carried Forward to Evaluation of Significance

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Features to be Evaluated
			Significant Wildlife Habitat for the Woodland Vole within 120m of the Project Location.
Animal Movement Corridors			
• Amphibian Movement	Y	Y	Candidate SWH for amphibian corridors in or within 120m of the Project Location associated with riparian hedgerows.
Areas of Natural and Scientific Interest (ANSI) • Life Science ANSI • Earth Science ANSI	Y	Y	1 provincially significant and 3 regionally significant Life Science ANSIs within 120m of the Project Location. 1 provincially significant Earth Science ANSI within the Project Location
Provincial Plan Areas	Y	Y	Niagara Escarpment Plan Area and Greenbelt Plan Area natural features (Transmission Line Only)
Provincial Parks and Conservation Reserves	N	N	None

Natural features identified in the records review were confirmed through the site investigation program. Corrections made to the records review are provided in **Table 3.2, Appendix B.**

4.4 QUALIFICATIONS

Personnel responsible for conducting the site investigation are listed in **Table 4.1, Appendix B.** Where available, curricula vitae are provided in **Appendix E**.

5.0 Evaluation of Significance

Natural heritage information collected from the records review, the site investigation and 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 120m of, the Project Location, a determination was made of whether the natural feature is provincially significant, significant, not provincially significant or not significant using evaluation criteria or procedures established or accepted by MNR.

Natural features present in and within 120m of the Project Location requiring an Evaluation of Significance are identified in **Table 4.7**.

5.1 METHODS

Sources used in the evaluation of significance for the natural features within 120m of the Project Location included:

- Ontario Wetland Evaluation System (MNR, 2002);
- Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2012);
- Natural Heritage Reference Manual (MNR, 2010)
- Significant Wildlife Habitat Technical Guide (MNR, 2000); and
- Draft Significant Wildlife Habitat Ecoregion 7E 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) 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) assessments and the schedules of the *Species at Risk Act* (SARA) were used to determine species protection.

Any identified species or species habitat designated as threatened or endangered in accordance with the *Endangered Species Act* is beyond the scope of this report and will be dealt with through consultation with the MNR to confirm permit and approval requirements.

Natural features as identified through the site investigations are shown on **Figures 7.1 to 7.58, Appendix A**. Specific methods used in the evaluation of significance for each type of natural feature are detailed in the following sections.

5.1.1 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 OWES trained surveyor. Boundaries as delineated during field investigations were considered accurate for the purposes of this report.

During site investigations, additional wetland communities were identified in and within 120m of the Project Location. Data were collected through desktop procedures (e.g. aerial photograph interpretation) to supplement on-site field investigations. As described in **Section 4.2.2.3**, site investigations confirmed the presence of 64unevaluated wetland features greater than 0.5ha in size within 120m of the Project Location. No unevaluated wetlands were identified within the Project Location.

5.1.1.1 Wetland Evaluation

A method for Wetland Characteristics and Ecological Functions Assessment (WCEFA) was developed by the Ministry of Natural Resources (MNR) to provide a set of evaluation criteria focused on wetland attributes relevant to the completion of an Environmental Impact Statement (EIS) for renewable energy projects. The criteria to be evaluated are presented in Appendix C of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011c).

Unevaluated wetlands that occur within 120 m of the Project Location, but not in the Project Location, will be assessed using on-site field investigations and the WCEFA to determine the potential impacts created by construction of wind farms, their access roads and associated infrastructure (project components). Where the aforementioned wetland communities extend beyond 120 m of the Project Location, they will be included in the assessment to ensure accurate documentation of the features and functions. Only unevaluated wetland communities contiguous with those in and within 120 m of the Project Location will be assessed. Unevaluated wetlands occurring in the Project Location will be assessed using the Ontario Wetland Evaluation System (OWES) (MNR, 2002).

Data were collected through desktop procedures (e.g. aerial photograph interpretation) and on-site field investigations conducted from the Property Location. The criteria and procedures found within Appendix C of the Draft *Natural heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011c) are based on sections of the OWES – Southern Edition (MNR, 2002). Although this procedure does not evaluate the significance of these wetlands, 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. Specifically, these criteria were addressed in the following manner:

Biological Component

Wetland Size*:* This determination is based on the overall size of the contiguous wetland, including areas that are within but extend beyond 120 m of the Project Location. Data is based on field surveys and/or aerial photo interpretation. (OWES Section 1.3)

Wetland Type*:* The dominant wetland type in the contiguous unit is listed. Data is based on field surveys and/or aerial photo interpretation. (OWES Section 1.1.2)

Site Type*:* The wetland site type is stated. Data is based on field surveys and/or aerial photo interpretation. (OWES Section 1.1.3)

Vegetation Communities*:* Each vegetation community in the contiguous unit is listed, based on the requirements of OWES. Data is based on field surveys where possible. (OWES Section 1.2.2)

Proximity to Other Wetlands*:* The approximate distance to the next closest wetland is provided. Data is based on field surveys and/or aerial photo interpretation. (OWES Section 1.2.4)

Interspersion*:* An estimate of the total number of interspersion points is provided, with consideration given to the scale of the map and complexity of the wetland type delineations. The interspersion number is provided in the Table. Data is based on field surveys and/or aerial photo interpretation. (OWES Section 1.2.5)

Open Water Types*:* The open water type number (page 52 of the OWES manual) is listed in the Table; data is based on field surveys and/or aerial photo interpretation. (OWES Section 1.2.6)

Hydrological Component

Flood Attenuation*:* The general proximity of the wetland within the local watershed is stated, indicating if it is headwater, mid-reach, or river-mouth. An estimate of the catchment area is also provided, either based on Digital Elevation Mapping, or topographic map interpretation.

Water Quality Improvement (Short Term):

- *Watershed Improvement Factor* (WIF) – this is based on presence/absence of specific site types (i.e. riverine, lacustrine wetlands at lake inflow or outflow; or palustrine wetlands with inflow isolated wetlands, or palustrine wetlands with no inflow or lacustrine wetlands on lake shoreline. The data was derived from field surveys where possible [OWES Section 3.2.1.1].

- *Adjacent and Watershed Land Use* (LUF) – estimated percent of land use and land use type (i.e. agricultural, urban or forested) is included for the catchment. The data was derived from field surveys where possible [OWES Section 3.2.1.2].

- *Pollutant Uptake Factor* (PUT) – this is based on the single *most* dominant vegetation form observed within the wetland community (data derived from field surveys where possible [OWES Section 3.2.1.3]), described as:
    - high proportion of emergent, submergent, and/or floating vegetation.
    - a high proportion of live trees, shrubs, herbs, or mosses.
    - a high proportion of wetland with little or no vegetation.

Water Quality Improvement (Long Term Nutrient Trap): Wetlands with a retentive capacity for nutrients (e.g., those with organic soils) provide protection for recharging groundwater. A characterization of wetland type and soil conditions is provided. Data is based on field surveys where possible, or soil series mapping (OWES Section 3.2.2):

- *Water Quality Improvement (Groundwater Discharge):* OWES establishes eight wetland features that provide evidence of discharge, where the evaluator must make observations on as many of the features as possible (OWES Section 3.2.3). Where available, data indicative of groundwater discharge was provided.

- *Shoreline Erosion Control:* Shoreline wetlands provide a measure of protection from shoreline erosion caused by flowing water or waves. A description of the dominant shoreline vegetation was provided based on field surveys and/or aerial photo interpretation (OWES Section 3.4):

- *Groundwater Recharge (Site Type):* Site type was included based on field surveys where possible (OWES Section 3.5.1):

- *Groundwater Recharge (Soils):* Soil type was indicated for each wetland unit, based on county soil mapping. (OWES Section 3.5.2)

The information for the above noted evaluation criteria is provided in **Table 5.1, Appendix B**.

5.1.2 Woodlands

Guidance provided in Section 6.2.2 of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011) 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 Project Location occurs within the Niagara Region and Haldimand County. Woodlands have not been identified in the *Haldimand County Official Plan. W*oodlands are delineated on the Niagara Region Natural Heritage Map of the Niagara Region Official Plan and the approach used by Niagara Region is consistent with the NHA Guide criterion for woodlands.

As described in **Section 4.2.3**, 215 woodland features were identified in orwithin 120m of the Project Location, and require an evaluation of significance. Evaluation of Significance is based

on a woodland cover of 17.12% in Haldimand County (GRCA, 2004) and 18.98% in the Niagara Region (NPCA, 2010).

5.1.3 Wildlife and Wildlife Habitat

5.1.3.1 Seasonal Concentration Areas

The criteria and methods used to evaluate the significance of candidate significant wildlife habitat for seasonal concentration areas in and within 120m of the Project Location are presented in **Table 5.1.** Survey dates and time are provided in **Table 4.1, Appendix B**.

Table 5.1 Criteria and Methods Used to Evaluate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
Deer Winter Congregation Areas	• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha. • Deer movement during winter in Eco-region 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. • Woodlots with high densities of deer due to artificial feeding are not significant	• Deer management is an MNR responsibility, deer winter congregation areas considered significant are mapped by MNR • The boundaries of the deer winter congregation areas were refined to correspond to the woodland features as identified during site investigations. • Because they are within 120m of project components with no operational impacts (any project component), they will be considered Generalized Candidate Significant Wildlife Habitat.
Landbird Migratory Birds	• Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant.	• Transects of 500m in length were chosen that corresponded to the major habitats likely to be utilized by migratory songbirds that occurred within 120m of the Project Location (mlsa1 – mlsa4). All species and their total numbers observed along each transect were recorded, as well as the habitat type(s) being surveyed. A handheld GPS unit was used to georeference transect start and end point locations. • Protocols were consistent with the guidance document Birds and Bird Habitats: Guidelines for Wind Power Projects (OMNR, 2010b). • 2 transects in mlsa1 were surveyed in the fall of 2011 and spring 2012. I transect in each mlsa3 and mlsa4 were surveyed in the Spring of 2012. • Pre-construction fall surveys will be

Table 5.1 Criteria and Methods Used to Evaluate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
		undertaken in mlsa3 and mlsa4. • No surveys will be undertaken in mlsa2 due to access constraints. This feature will be assumed to be significant • Surveys were conducted in the Fall from late early September to mid October 2011, with a total of 9 visits to each transect. • Surveys were conducted in the Spring from early April to late May 2,2012, with a total of 10 visits to each transect except for transects in mlsa3 and mlsa4, which were added at a later date. These transects were visited a total of 8 and 5 times, respectively.
Raptor Wintering Areas	• One or more Short-eared Owls or; • At least 10 individuals and two listed spp. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds.	• Walking transect surveys were conducted in each specific feature identified as candidate significant wildlife habitat for a winter raptor feeding and roosting area. The results of the site investigation indicated eight (8) candidate significant wildlife habitats occurred within the Project Location (wr1 – wr8). • Roosting winter raptor surveys occurred bi-weekly between November 17, 2011 and March 14, 2012. Surveys were conducted between late morning and late afternoon in conditions with good visibility. • Wandering transect surveys were conducted in specific areas identified as candidate significant winter raptor feeding and roosting areas • Surveyors traversed through the grassland habitat and adjacent woodlots watching for feeding or roosting raptors or owls. In woodlot features, observation emphasis was placed on coniferous trees. All raptor and owl observations were recorded on a field map of the candidate habitat, as well as the appropriate field data form. The route taken through the habitat was also recorded on the field map. In some cases, areas previously Identified as candidate significant habitat were found to be unsuitable due to changes to the grassland habitat component (i.e. the area had been ploughed or was identified as an

Table 5.1 Criteria and Methods Used to Evaluate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
		unsuitable crop) and therefore these areas were not surveyed. • Diurnal wintering raptor driving surveys occurred bi-weekly between November 17, 2011 and March 14, 2012.The driving surveys we undertaken to supplement the transect surveys and to document raptor use in the general vicinity of the Project Location. Observations of raptor use in the candidate habitats was undertaken during the driving surveys. • Short-eared Owl surveys were conducted bi-weekly between November 17, 2011 and March 14, 2012 with investigation occurring shortly before and at dusk to more accurately assess the presence and numbers of wintering Short-eared Owls. Due to the large scale of the Study Area and the limited time window in which to complete the Short-eared Owl surveys, these surveys were conducted over two evenings in order to accurately cover the Study Area. • Evaluation methods followed those outline in the "Bird and Bird Habitats: Guidelines for Wind Power Projects" (MNR, DATE)
Bat Maternity Colonies	• Presence of >20 Northern Myotis, >10Big Brown Bats, >20 Little Brown Myotis, >5 Adult Female Silver-haired Bats • Area of habitat includes entire woodland or the forest stand ELC Ecosite containing the maternity colonies.	• Significance is assumed. EOS surveys will be completed prior to construction. • 39 FODs (bmc1 bmc6, bmc8-11, bmc13-14 bmc16-18, bmc20, bmc23, bmc25-35, bmc37-38 bmc42-44, bmc47-55) within 120 m of Turbines will be surveyed during leaf-off condition in Spring to document ≥25cm dbh wildlife trees (per MNR 2011) and identify candidate forests for maternity colony roosts. • To determine the density of snags/cavity trees (decay class) ≥25cm diameter at breast height (dbh) within the forest site: • Select random plots across the represented area of the ELC plot • Survey fixed area 12.6m radius plots (equates to 0.05ha) • Measure the number of snags/cavity trees ≥25cm dbh in each plot • Use formula πr^2 to determine number of snags per hectare • Survey a minimum of 10 plots for sites ≤10ha and add another plot for each

Table 5.1 Criteria and Methods Used to Evaluate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
		extra hectare up to a maximum of 35 plots • Surveys should be conducted during the leaf-off period i.e. fall to early spring (so view of tree cavities and crevices is not obscured by foliage) • If snag/cavity tree density is ≥10 snags per hectare of trees ≥25cm dbh, then site is a candidate for maternity colony roosts • No surveys will be undertaken in bmc3, bmc12, bmc15, bmc19, bmc24, bmc36, bmc39, bmc45 and bmc46 due to access constraints. These features will be assumed to be significant. • All candidate forests for maternity colony roosts will be subject to evaluation of significance exit surveys in June (30 minutes before dusk until 60 minutes after dusk) to identify confirmed SWH. • If the total Tree Cavity Density is ≥10 cavity trees/ha, then 10-30 candidate roost trees per habitat will be monitored once. • Evaluation methods will follow the "Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats".
Turtle Wintering Areas	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – Apr). Congregation of turtles is more common where wintering areas are limited and therefore significant.	• EOS surveys are required to determine significance. Habitat use surveys will be conducted in the spring of 2013 to determine the use of twa-1. The over-wintering area will be searched within 120 m of project components for congregations (basking area) of turtles on warm, sunny days during the spring (April-May). The feature will be surveyed a minimum of 3 times: once early in the season (e.g. early April); once in mid-season (e.g. mid April), and once later in the season (e.g. early May). For each survey, the surveyor will walk the boundary of the feature where turtles are likely to be basking. Data, including species and numbers of individuals, will be recorded on Reptile Hibernacula Observation Forms
Snake Hibernacula	• Presence of snake hibernacula used by a minimum of five individuals or two species of listed snake species (Eastern Gartersnake, Northern Watersnake,	• Significance assumed. EOS surveys will be completed as part of the pre-construction commitments. • Hibernacula emergence/exit surveys will

Table 5.1 Criteria and Methods Used to Evaluate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Criteria	Methods
	Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake) • Habitat is considered significant if either Milksnake or Eastern Ribbonsnake is present.	be conducted between the hours of 10:00 am and 3:00 pm on sunny warm days in spring (April/May) at the location of the candidate hibernacula. Each feature will be surveyed a minimum of 3 times: once early in the season (e.g., early April); once in mid-season (e.g., mid April), and once later in the season (e.g., early May). • For each survey, the surveyor will observe for 20 minutes, recording all snake species and number of individuals observed entering or exiting the candidate hibernacula. The search pattern at each hibernaculum will include surveying all potential basking and sheltering habitat within the location (i.e., an area including a 30 m radius around the hibernaculum). The search route will be tracked using a GPS unit so the search pattern can be easily repeated.

5.1.3.2 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 120m of the Project Location are presented in **Table 5.2.** Survey dates and time are provided in **Table 4.1, Appendix B.**

Table 5.2 Criteria and Methods Used to Evaluate Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Communities or Specialized Habitat for Wildlife	Criteria	Methods
Cliffs and Talus Slopes	• Any ELC Ecosite within Community Series: TAO, CLO, TAS, CLS, TAT, CLT	• Confirmed any ELC Vegetation Type for Cliffs or Talus Slopes • Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.
Other Rare Vegetation Communities	• ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M	• Field studies confirmed if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG • Those features not within 120m of project

Table 5.2 Criteria and Methods Used to Evaluate Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Communities or Specialized Habitat for Wildlife	Criteria	Methods
		components with operational impacts will be considered Generalized Candidate Significant Wildlife Habitat.
Woodland Raptor Nesting Habitat	• All natural or conifer plantation woodland/forest stands combined >30ha with >4 ha of interior habitat.	• Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.
Turtle Nesting Habitat	• Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWHÍ. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH • Travel routes from wetland to nesting area are to be considered within the SWH • Field investigations should be conducted in prime nesting season typically late spring to early summer.	• Significance assumed. EOS surveys will be completed as part of the pre-construction • Prior to conducting evaluation of significance surveys, additional site investigation work will be conducted to determine if current land use within candidate habitats meet the habitat requirements as outlined in the Ecoregion criterion schedule (exposed sand and gravel deposits). If habitat is than EOS surveys need to be completed. • Candidate habitats will be surveyed on two separate dates during the breeding season (June) to make direct observations of turtle nesting and one additional survey in mid-July to make observations of nesting evidence (e.g. hatched eggs and/or nests that have been dug up by predators). • Walking surveys will occur between 7:00 and 11:00 pm to systematically inspect all areas of exposed mineral (sand or gravel) substrates, spending a minimum of 15 minutes for every 100m^2 of candidate nesting substrate. • Surveyors will map and photo-document areas of exposed substrates, and photo-document any observed nesting evidence.
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).	• Surveys to confirm breeding/larval stages were undertaken during the spring (April-June) when amphibians are concentrated around suitable breeding habitat within or near the woodlands. • Evaluation Methods followed the Marsh Monitoring protocol (BSC, 2003) • Counts were conducted between one half

Table 5.2 Criteria and Methods Used to Evaluate Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Communities or Specialized Habitat for Wildlife	Criteria	Methods
	• The habitat is the woodland (ELC polygons) and wetland (ELC polygons) combined. A travel corridor connecting the woodland and wetland polygons is to be included in the habitat.	hour after sunset and midnight under appropriate weather conditions. This protocol involved the surveyor standing at each station and listening for 3 minutes, recording amphibians if they were heard calling within 100 m. Any species heard calling outside of the station (>100 m) were also recorded accordingly. • Amphibian call count surveys were undertaken on 10 days in April, 8 days in May and 11 days in June. • A total of 106 stations within the Study Area were surveyed (**Figures 6.1 – 6.58, Appendix A**) • Those features not within 120m of project components with operational impacts (collector lines, transmission lines, turbines and laydown areas) will be considered Generalized Candidate Significant Wildlife Habitat.
Amphibian breeding habitat (wetland)	• Presence of breeding population of 1or more of the listed salamander species (i.e., Eastern Newt, Spotted Salamander, Four-toed Salamander or Blue-spotted Salamander) or 2 or more of the listed frog or toad species (e.g., American Toad, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog or Bullfrog) and with at least 20 breeding individuals (adults, juveniles, eggs/larval masses) or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH.	• Surveys were undertaken to confirm breeding during spring (Apr to June) when amphibians are migrating, calling and breeding within the wetland habitats. • Evaluation Methods followed the Marsh Monitoring protocol (BSC, 2003). • Counts were conducted between one half hour after sunset and midnight under appropriate weather conditions. This protocol involved the surveyor standing at each station and listening for 3 minutes, recording amphibians if they were heard calling within 100 m. Any species heard calling outside of the station (>100 m) were also recorded accordingly. • A total of twenty-six stations within the Study Area were surveyed (**Figures 6.1 – 6.58, Appendix A**) • Amphibian call count surveys were undertaken on 10 days in April, 8 days in May and 11 days in June. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered.

Table 5.2 Criteria and Methods Used to Evaluate Rare Vegetation Communities or Specialized Habitat for Wildlife

Candidate Rare Vegetation Communities or Specialized Habitat for Wildlife	Criteria	Methods
		• Those features not within 120m of project components with operational impacts (collector lines, transmission lines, turbines and laydown areas) will be considered Generalized Candidate Significant Wildlife Habitat.

5.1.3.3 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 within 120m of the Project Location are presented in **Table 5.3**.Survey dates and time are provided in **Table 4.1, Appendix B**.

Table 5.3 Criteria and Methods Used to Evaluate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods
Marsh Bird Breeding Habitat	• Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species (i.e., American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Green Heron or Trumpeter Swan). • Any wetland with breeding of 1 or more Trumpeter Swans, Black Terns or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH.	• The results of the site investigation indicated two (2) candidate significant wildlife habitats occurred in or within the Project Location • Three rounds of surveys for breeding birds were conducted; with four person days per round. The first was conducted on May 31 and June 2, the second round June 14 and 15 and the third round June 28 and 29. • Surveys were comprised of point counts and were augmented by area searches. Surveys began at, or within, half an hour of sunrise and were completed by 10:00 a.m. Area searches were conducted to identify as many breeding bird species as possible that were utilizing the habitat. • All species observed were recorded along with which habitat type(s) the species was observed in as well as the level of breeding evidence detected. • Evaluation methods followed “Bird and Bird Habitats: Guidelines for Wind Power

Table 5.3 Criteria and Methods Used to Evaluate Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Criteria	Methods
		Projects"
Woodland Area-sensitive Bird Breeding Habitat	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH	• Because they are not within 120m of project components with operational impacts (any project component), they will be considered Generalized Candidate Significant Wildlife Habitat.
Terrestrial Crayfish	• Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites • Area of ELC Ecosite polygon is the SWH • Surveys should be done during adult breeding season (April to late June) and in late summer-early August in nearby temporary or permanent water for juveniles. Note the presence of burrows or chimneys are often the only indicator of presence, observance of individuals is very difficult	• Surveys for individuals and chimneys were conducted in conjunction with site investigation ELC surveys in suitable habitat.
Special Concern and Rare Wildlife Species	• Presence of any of the potential species listed in **Table 3.2, Appendix B** (1 amphibian species, 11 birds, 4 reptiles, 9 insects and 4 mammals)	• Conducted field investigations in the identified habitats in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Pre-construction survey protocols will be approved by MNR and detailed in the EIS

5.1.3.4 Animal Movement Corridors

The criteria and methods used to evaluate the significance of candidate significant wildlife habitat for animal movement corridors within 120m of the Project Location are presented in **Table 5.4.**

Table 5.4 Criteria and Methods Used to Evaluate Animal Movement Corridors

Candidate Animal Movement Corridor	Criteria	Methods
Amphibian Corridors	• Corridors should consist of native vegetation, roadless area, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant. • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m 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.	Amphibian movement corridors were considered when amphibian movement breeding habitat (wetland) had been confirmed as significant wildlife habitat. ELC mapping and aerial photography was then used to determine specific amphibian movement corridors.

5.1.4 Areas of Natural and Scientific Interest

Life Science and Earth Science ANSIs were treated as provincially significant if they had been identified as such by MNR. This information was obtained from NHIC and through correspondence with the local MNR District.

5.1.5 Provincial Plan Areas

A portion of the transmission line corridor has been identified as being within the Protected Countryside of the Greenbelt Plan Area as shown on **Figures 2.3 - 2.5, Appendix A**. Although no sand barrens, savannah, tallgrass prairie or alvar communities were observed in or within 120 m of the Project Location, other natural features within the Greenbelt Plan Area have been evaluated for significance in accordance with the methods described in Sections 5.1.1 to 5.1.5.

5.2 RESULTS

Results of the evaluation of significance for wetlands and woodlands are shown in **Figures 7.1-7.58Appendix A** and detailed results of the evaluation of significance for woodlands are located in **Table 5.2, Appendix B.** The locations of individual features relative to the Project Location are shown in **Figures 7.1 – 7.58, Appendix A**. The following sections summarize the results of the evaluation of significance for natural features in or within 120m of the Project Location.

5.2.1 Wetlands

Ninety three (93) wetland features assessed by MNR as provincially significant (88) or locally significant (5) occurred within 120m of the Project Location. Sixty four (64) unevaluated wetlands were identified within 120m of the Project Location.

The unevaluated wetlands (we1, we5, we20, we28, we47, we51, we94, we95, we118, we131, we147, we 150, we160, we164, we166, we186, we202, we210, we216, we218, we222, we231, we237, we240, we269, we276, we292, we299, we303, we304, we308, we309, we311, we314, we320, we322, we344, we356, we358, we364, we365,we373, we376, we377, we380, we383, we384, we385, we387, we389, we391, we392, we393, we395, we396, we398, we402, we403, we404, we409, we414, we425, we426 and we434) were evaluated using the *Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects* described in **Section 5.1.1.1**. The results of the evaluation are on **Table 5.1, Appendix B**. Under the WCEFA procedure, these wetlands are considered to be significant for the purposes of the NHA and project siting. No project components are proposed in or on, a significant wetland.

Underground collector lines are proposed to be directionally drilled under 10Provincially Significant wetland features (we100, we234, we240, we286, we292, we317, we402 we403, we407 and we423) on private property. The significant wetlands located within 120m of the Project Location will be included in the EIS. Alternatively, a collector and transmission line is being considered over the Welland River (we423) and a collector line over the Welland Feeder Canal (we407).

5.2.2 Woodlands

Criteria for woodland significance were applied to each of the woodland features located in or within 120m of the Project Location. Results of the evaluation are provided in **Table 5.2 Appendix B**. One hundred and forty (104) of the woodland features met the criteria for significance based on criteria standards within the Natural Heritage Assessment Guide for Renewable Energy Projects. These included woodland features wo5, wo14, wo15, wo22, wo24, wo25, wo35, wo36, wo43, wo44, wo45, wo46, wo47, wo49, wo50, wo52, wo55, wo58, wo61, wo62, wo63, wo66, wo67, wo68, wo69, wo74, wo80, wo82, wo83, wo85, wo86, wo88, wo89, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo104, wo105, wo106, wo107, wo108, wo109, wo111, wo112, wo113, wo114, wo115, wo119, wo121, wo124, wo126, wo127, wo129, wo132, wo135, wo136, wo138, wo139, wo140, wo141, wo142, wo144, wo145, wo149, wo150, wo151, wo153, wo154, wo156, wo160, wo163, wo170, wo172, wo173, wo176, wo177, wo178, wo179, wo180, wo183, wo184, wo185, wo190, wo191, wo194, wo195, wo196, wo198, wo199, wo206, wo208, wo212, wo213, wo216, wo217, wo218, wwo220, wo221 and wo223.

The 104 significant woodlands located within 120m of the Project Location are shown on **Figures 7.1 to 7.58, Appendix A**. Significant woodlands in or within 120m of the Project Location will be included in the EIS.

Underground collector lines are proposed to be directionally drilled under seven (7) significant woodland features (wo66, wo105, wo113, wo119, wo153, wo191 andwo194). The significant woodlands located within 120m of the Project Location will be included in the EIS.

5.2.3 Wildlife and Wildlife Habitat

5.2.3.1 Seasonal Concentration Areas of Animals

Evaluations of significance for candidate SWH for seasonal concentration areas in and within 120m of the Project Location are presented in **Table 5.5**. Significant wildlife habitat features are shown on **Figures 7.1 – 7.58, Appendix A.**

Table 5.5 Summary of Evaluation of Significance Results for Rare Vegetation Communities or Specialized Habitat for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Deer Winter Congregation Areas	Yes	Deer management is an MNR responsibility, deer winter congregation areas considered significant are mapped by MNR and were refined to correspond to woodlands identified during site investigations. 118 features are located within 120m of the Project Location. Underground collector lines are proposed under 4 features (dc35, dc56, dc70 and dc93). Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat	Yes (as Generalized Candidate Significant Wildlife Habitat)
Landbird Migratory Birds	Yes	A total of 195 species of birds were observed during the fall migration in 2011 and spring migration in 2012. All Species identified are ranked S5 (i.e., secure - common and widespread and abundant in Ontario), or S4 (i.e., apparently secure – uncommon but not rare), except for the Gray-cheeked Thrush, ranked S2S4B. As a result of site investigations, mlsa1 identified as candidate significant wildlife habitat for landbird migratory birds met the criteria for significance (see **Table 5.3, Appendix B** for evaluation results). Mlsa3 and mlsa4 are treated as significant for the purposes of this report. Pre-construction fall migratory surveys will be undertaken in these features using the same methodology as those undertaken in mlsa1. Mlsa2 is treated as significant for the purposes of this report. Evaluation of significance surveys are not possible in this feature due to access constraints. **Table 5.4, Appendix B** provides a detailed list of the migratory bird species and numbers observed during Stantec's migration surveys in each candidate significant wildlife habitat feature.	Yes (mlsa1-mlsa4)within 120m of the Project Location
Raptor Wintering Areas	Yes	A total of 11 species were observed during the winter transect surveys of 2011. Red-tailed Hawk (36	Yes (wr1, wr2,wr4 within

Table 5.5 Summary of Evaluation of Significance Results for Rare Vegetation Communities or Specialized Habitat for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		observations) was the most abundant raptor observed, followed by Short-eared Owl (12 observations) and Turkey Vulture (10 observations). A total of 12 species of raptors were observed during the winter driving surveys of 2011. Red-tailed Hawk (647 observations) was the most abundant raptor observed during the afternoon surveys, followed by Turkey Vulture (352 observations) and American Kestrel (107 observations). These observations are consistent with species in this area identified during records review. The data from the driving surveys adjacent to candidate habitats supplemented observations from transect surveys to determine the significance of these features. No Short-eared Owls were observed during winter raptor driving surveys. A total of 16 Short-eared Owl observations were made over the course of the evening driving surveys for Short-eared Owl. None of the observations were in candidate significant wildlife habitat features within 120m of Project Components. As a result of site investigations, four (4) features (wr1-wr4) identified as candidate significant wildlife habitat for raptor winter areas met the criteria for significance (see **Table 5.5, Appendix B** for evaluation results). . **Appendix K** provides a detailed list of the raptor species and numbers observed during Stantec's transect and Short-eared Owl surveys in each candidate significant wildlife habitat feature.	120m of the Project Location and wr3 in the Project Location)
Bat Maternity Colonies	Unconfirmed –Pending pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat will be treated as significant No surveys will be undertaken in bmc3, bmc12, bmc15, bmc19, bmc24, bmc36, bmc39, bmc45 and bmc46 due to access constraints. These features will be treated as significant with a commitment to conducting post-construction mortality monitoring.	48 potential candidate significant wildlife habitats for bat maternity colonies within 120m of turbines (bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55).
Turtle Wintering	Yes	Significance cannot be assumed as per the NHA Guide as the transmission line may be constructed over the feature. EOS surveys are planned for 2013 to determine significance.	Yes (tw1)

Table 5.5 Summary of Evaluation of Significance Results for Rare Vegetation Communities or Specialized Habitat for Seasonal Concentration Areas

Candidate Seasonal Concentration Areas	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Snake Hibernacula	Unconfirmed – pending Pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat will be treated as significant.	Yes (sh2, sh3, sh4, sh6, sh7) within 120m of the Project Location) sh5(Generalized)

5.2.3.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Evaluations of significance for candidate SWH for rare vegetation communities or specialized habitat for wildlife within 120m of the Project Location are presented in **Table 5.6**.

Table 5.6 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 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Cliffs and Talus Slopes	Yes	Two rare vegetation communities (CLO1 and TAT1-7*) along the transmission line route were observed during site investigations. Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.	Yes (as Generalized Candidate Significant Wildlife Habitat)
Other Rare Vegetation Communities	Yes	6 rare vegetation communities were observed during vegetation surveys and woodland assessment of all woodlands in and within 120m of the Project Location. Those features not within 120m of project components with operational impacts will be considered Generalized Candidate Significant Wildlife Habitat. Those features within 120m of project components with operational are considered significant wildlife habitat for the purposes of this report.	Yes (rv2, rv3)within 120m of the Project Location Generalized (rv1, rv4, rv6, rv7)
Woodland Raptor Nesting Habitat	Yes	9 woodlands >30ha with >4ha of interior forest habitat (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212) were found within 120m of the	Yes (as Generalized Candidate

Table 5.6 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 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
		Project Location. Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.	Significant Wildlife Habitat)
Turtle Nesting Habitat	Unconfirmed – Pending pre-construction surveys.	Evaluation of significance surveys have not yet been completed, this habitat will be treated as significant. Those features within 120m of project components with operational are considered significant wildlife habitat for the purposes of this report.	Yes (th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69)within 120m of the Project Location Generalized (53)
Amphibian breeding habitat (woodland)	Yes	As a result of site investigations, 22features (ah2, ah3, ah9, ah29, ah31, ah34, ah37, ah38, ah45, ah47, ah49, ah57, ah61, ah64, ah65, ah66, ah67, ah70, ah74, ah75, ah79 and ah89) identified as candidate significant wildlife habitat for woodland amphibian breeding habitat met the criteria for significance (see **Table 5.7, Appendix B** for evaluation results). Underground collector lines are proposed under feature ah67. **Table 5.9, Appendix B** provides species information specific to each feature as a result of amphibian call count and visual inspection surveys	Yes (22)within 120m of the Project Location Generalized (513)
Amphibian breeding habitat (wetland)	Yes	As a result of site investigations, 5 features (ah25,ah32, ah35, ah55, ah83) identified as candidate significant wildlife habitat for wetland amphibian breeding habitat met the criteria for significance (see **Table 5.8, Appendix B** for evaluation results). Underground collector lines are proposed under feature ah35. **Table 5.9, Appendix B** provides species information specific to each feature as a result of amphibian call count and visual inspection surveys	Yes (5)within 120m of the Project Location

5.2.3.3 Habitat for Species of Conservation Concern

Evaluations of significance for candidate SWH for Species of Conservation Concern within 120m of the Project Location are presented in **Table 5.7.**

Table 5.7 Summary of Evaluation of Significance Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Marsh Breeding Birds	No	As a result of site investigations, no features identified as candidate significant wildlife habitat for marsh breeding birds met the criteria for significance (see **Table 5.6, Appendix B** for evaluation results). **Table 5.10, Appendix B** provides a detailed list of the breeding bird species and numbers observed during Stantec's surveys in each candidate significant wildlife habitat feature	No
Woodland Area-sensitive Bird Breeding Habitat	Yes	9 woodlands >30ha with >4ha of interior forest habitat (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194, wo212) were found within 120m of the Project Location. Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.	Yes (as Generalized Candidate Significant Wildlife Habitat)
Terrestrial Crayfish	No	No individuals or chimneys were observed during site investigations, therefore no significant wildlife habitat for Terrestrial Crayfish is present.	No
Special Concern and Rare Wildlife Species	Yes	Two (2) rare plant species, Honey Locust (S2) and Fullers Hawthorne (S2) were recorded within 120m of the proposed Transmission Line. The remainder of the 284 native plant species recorded within 120m of the Project Location are ranked S5 (secure in Ontario) or S4 (apparently secure in Ontario). A complete list of vascular plant species recorded within 120m of the Project Location is included in **Appendix G**.	Generalized

Table 5.7 Summary of Evaluation of Significance Results for Habitat for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Short-eared Owls	Yes	Short-eared Owls were identified in winter raptor features wr1 – wr4. (see **Table 5.5, Appendix B** for evaluation results). **Appendix K** provides the details of the Short-eared Owl surveys in each candidate significant wildlife habitat feature.	Yes (wr1, wr2, wr4 within 120m of the Project Location and wr3 in the Project Location)
Woodland Vole	Yes	Because they are not within 120m of project components with operational impacts, they will be considered Generalized Candidate Significant Wildlife Habitat.	Yes (as Generalized Candidate Significant Wildlife Habitat)
Snapping Turtle	Unconfirmed – pending pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat (th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69)will be treated as significant.	Yes
Milksnake	Unconfirmed – pending pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat (sh2, sh3, sh4, sh6, sh7) will be treated as significant.	Yes (sh2, sh3, sh4, sh6, sh7) within 120m of the Project Location) sh5 (Generalized)
Eastern Ribbonsnake	Unconfirmed – pending pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat (sh2, sh3, sh4, sh6, sh7) will be treated as significant.	Yes (sh2, sh3, sh4, sh6, sh7) within 120m of the Project Location) sh5 (Generalized)
Small-footed Bat	Unconfirmed – pending pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat will be treated as significant.	Yes (bmc1-55) within 120m of a turbine
Eastern Pipistrelle	Unconfirmed – pending pre-construction surveys	Evaluation of significance surveys have not yet been completed; this habitat will be treated as significant.	Yes (bmc1-55) within 120m of a turbine

5.2.3.4 Animal Movement Corridors

Evaluations of significance for candidate SWH for animal movement corridors within 120m of the Project Location are presented in **Table 5.8**.

Table 5.8 Summary of Evaluation of Significance Results for Animal Movement Corridors

Candidate Animal Movement Corridors	Present in or within 120m of Project Location	Rationale	Carried Forward to Summary and EIS (Y/N)
Amphibian Corridors	No	A total of 5 riparian/hedgerow communities within 120m of the Project Location adjacent to significant amphibian habitat were identified through ELC mapping and confirmed during site investigations (see **Figures 3.1 to 3.58, Appendix A**). These hedgerow communities were very narrow (< 200 m), and were also associated with fragmented segments (gaps > 20 m) of riparian habitat along minor watercourses. Riparian vegetation was rarely in excess of 15 m in width on either side of waterways. The riparian hedgerows did not form a continuous link between wildlife habitats and do not facilitate animal movement. As such, these riparian hedgerows are not considered significant wildlife habitat.	No

5.2.4 Areas of Natural and Scientific Interest

5.2.4.1 Life Science

One provincially significant Life Science ANSI (South St. Ann's Slough Forest Provincially Significant Life Science ANSI) has been identified within 120m of the Project Location and is shown on **Figures 7.13 and 7.14, Appendix A**. An EIS has been completed for this feature (Section 6.0).

5.2.4.2 Earth Science

One Earth Science ANSI (Winger Provincially Significant Earth Science ANSI)has been identified in the Project Location. This Earth Science ANSI has been identified by the MNR as including relatively undisturbed parabolic and longitudinal sand dunes typical of this part of Ontario (see Section 3.2.4.2). Based on site investigations, the project components will be constructed within a relatively flat agricultural field (corn, wheat), outside of any naturally vegetated areas, and does not include the longitudinal sand dune formations intended to be represented by this ANSI. It is shown on **Figure 7.49, Appendix A**. An EIS has been completed for the feature (Section 6.0).

5.2.5 Provincial Plan Areas

A portion of the transmission line corridor has been identified as being within the Greenbelt Plan Area as shown on **Figures 2.3 - 2.5, Appendix A** and within the Niagara Escarpment Plan Area as shown on **Figures 2.2 - 2.3, Appendix A.** An EIS has been completed for the natural features that occur within these Provincial Plan Areas (Section 6.0).

5.3 SUMMARY

This Natural Heritage Assessment was undertaken to identify natural features found in or within 120m of the Project Location and evaluate their significance. This report has been prepared in accordance with O. Reg. 359/09.

Based on an evaluation of significance, significant natural features identified within 120m of the Project Location are presented in **Table 5.9**.

Table 5.9 Natural Features Carried Forward to Environmental Impact Study

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Carried Forward to Environmental Impact Study (Y/N)	Significant Natural Feature
Wetlands	Y	Y	Y	88ProvinciallySignificant wetland features and 64unevaluated wetlands treated as Significant within 120m of the Project Location. Underground collector lines to be directionally drilled under10 wetland features (we100, we234, we240, we286, we292, we317, we402, we403, we407 and we423). Overhead collector and transmission lines are also considered over we407 and we423.
Woodlands	Y	Y	Y	104 significant woodland features within 120m of the Project Location. Underground collector lines to be directionally drilled under 7

Table 5.9 Natural Features Carried Forward to Environmental Impact Study

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Carried Forward to Environmental Impact Study (Y/N)	Significant Natural Feature
				significant woodland features (wo66, wo105, wo113, wo119, wo153, wo191 and wo194)
Wildlife Habitat				
Seasonal Concentration Area				
Deer winter congregation areas	Y	Y	Y	118features located within 120m of the Project Location. Underground collector lines are proposed under 4 features (dc35, dc56, dc70 and dc93). Considered Generalized Candidate Significant Wildlife Habitat
Colonial bird nesting sites (bank and cliff) Colonial bird nesting sites (tree/shrub) Colonial bird nesting sites (ground)	Y	N	N	
• Waterfowl stopover and staging areas (terrestrial) • Waterfowl stopover and staging areas (aquatic)	Y	N	N	
• Shorebird migratory stopover areas	Y	N	N	
• Landbird migratory stopover areas	Y	Y	Y	mlsa1-mlsa4 within 120m of the Project Location Pre-construction fall surveys will be undertaken in mlsa3 and mlsa4
• Raptor wintering areas	Y	Y	Y	Yes (wr1, wr2,wr4 within 120m of the Project Location and wr3 in the Project Location) Generalized (wr3)
• Bat hibernacula	Y	N	N	
• Bat maternity colonies	Y	Y	Y	Yes (bmc1, bmc3,

Table 5.9 Natural Features Carried Forward to Environmental Impact Study

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Carried Forward to Environmental Impact Study (Y/N)	Significant Natural Feature
				bmc6, bmc7-20, bmc23-39, bmc42-55). Pre-construction surveys will be undertaken in these features.
• Bat migratory stopover areas	N	N	N	
• Turtle wintering areas	Y	Y	Y	twa1 within the project location (overhead line). EOS surveys are required.
• Snake hibernaculum	Y	Y	Y	sh2, sh3, sh4, sh6, sh7 within 120m of the Project Location. sh5 (Generalized) Pre-construction surveys will be undertaken in these features.
• Migratory butterfly stopover areas	N	N	N	
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	Y	Y	ClO1 and TAT1-7* (Generalized) Yes (rv2, rv3 are within 120m of the Project Location) Generalized (rv1, rv4, rv6, rv7)
Specialized Habitat for Wildlife				
• Waterfowl nesting area	Y	N	N	
• Bald Eagle and Osprey nesting, foraging, and perching habitat;	N	N	N	
• Woodland raptor nesting	Y	Y	Y	Nine (9) woodland

Table 5.9 Natural Features Carried Forward to Environmental Impact Study

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Carried Forward to Environmental Impact Study (Y/N)	Significant Natural Feature
habitat;				raptor nesting habitat features considered Generalized Candidate Significant Wildlife Habitat (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212)
• Turtle nesting habitat	Y	Y	Y	18Turtle nesting habitat features treated as significant (th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69)within 120m of the Project Location. Pre-construction surveys will be undertaken in these features. Generalized (53)
• Seeps and springs.	Y	N	N	
• Amphibian breeding habitat (woodland) • Amphibian breeding habitat (wetland)	Y	Y	Y	Woodland - ah2, ah3, ah9, ah29, ah31, ah34, ah37, ah38, ah45, ah47, ah49, ah57, ah61, ah64, ah65, ah66, ah67, ah70, ah74, ah75, ah79 and ah89 within 120m of the Project Location. Underground collector lines are proposed under ah67. Wetland - ah25, ah32, ah35, ah55, ah83 within 120m of the Project Location. Underground collector lines are proposed under ah35. Generalized – 513
Habitat for Species of Conservation Concern				
• Marsh Bird Breeding Habitat	Y	Y	N	
• Bird Breeding Habitat	Y	Y	Y	Nine (9) wildlife habitats

Table 5.9 Natural Features Carried Forward to Environmental Impact Study

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Carried Forward to Environmental Impact Study (Y/N)	Significant Natural Feature
(woodland area-sensitive) • Bird Breeding Habitat (open country) • Bird Breeding Habitat (shrub/early successional)	Y N	N N	N N	for interior breeding bird habitat considered Generalized Candidate Significant Wildlife Habitat. (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212)
• Terrestrial Crayfish	Y	N	N	
• Special Concern and Rare Wildlife Species	Y	Y	Y	No - Plants
Short-eared Owl	Y	Y	Y	Yes (wr1, wr2, wr4 within 120m of the Project Location and wr3 in the Project Location)
Snapping Turtle	Y	Y	Y	18habitat features treated as significant (th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69) within 120m of the Project Location. Pre-construction surveys will be undertaken in these features.
Woodland Vole	Y	Y	Y	Considered Generalized Candidate Significant Wildlife Habitat
Milksnake	Y	Y	Y	sh2, sh3, sh4, sh6, sh7 within 120m of the Project Location. sh5 (Generalized) Pre-construction surveys will be undertaken in these features.
Eastern Ribbonsnake	Y	Y	Y	sh2, sh3, sh4, sh6, sh7 within 120m of the Project Location.

Table 5.9 Natural Features Carried Forward to Environmental Impact Study

Feature	Carried Forward to Site Investigation (Y/N)	Carried Forward to Evaluation of Significance (Y/N)	Carried Forward to Environmental Impact Study (Y/N)	Significant Natural Feature
				sh5 (Generalized) Pre-construction surveys will be undertaken in these features.
Small-footed Bat	Y	Y	Y	Yes (bmc1, bmc3, bmc6, bmc7-16, bmc20, bmc23-39, bmc42-55) within 120m of a turbine Pre-construction surveys will be undertaken in these features.
Eastern Pipistrelle	Y	Y	Y	Yes (bmc1, bmc3, bmc6, bmc7-16, bmc20, bmc23-39, bmc42-55) within 120m of a turbine Pre-construction surveys will be undertaken in these features.
Animal Movement Corridors				
• Amphibian Movement	Y	Y	N	
Areas of Natural and Scientific Interest (ANSI) • Life Science ANSI • Earth Science ANSI	Y	Y	Y	1 provincially significant Life Science ANSIs within 120m of the Project Location. 1 provincially significant Earth Science ANSI within the Project Location
Specified Provincial Plan Areas	Y	Y	Y	Niagara Escarpment Plan Area Greenbelt
Provincial Parks and Conservation Reserves	N	N	N	

The locations of these features are presented in **Figures 7.1 – 7.58, Appendix A**.

An Environmental Impact Study will be prepared to identify and assess any negative environmental effects and develop mitigation measures to avoid or minimize adverse effects on these features.

6.0 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. 359/08, s. 37). Such facilities may be permitted within the following areas subject to the completion of an EIS:

- provincially significant northern wetland;
- provincially significant life science ANSI;
- 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;
- provincially significant earth science area of natural and scientific interest (ANSI); or
- within 50 m of a provincially significant earth science ANSI (O. Reg. 359/09, s. (38(1)).

Several collector lines are proposed to be installed beneath significant woodlands and wetlands, and the transmission line is proposed beneath the Welland River. Alternatively, a collector and transmission line is also being considered over the Welland River (we423) and a collector line over the Welland Feeder Canal (we407) instead of directional drill under these wetlands. In order to avoid direct impacts on significant natural features, the siting of project components targeted active agricultural fields and right of ways during the iterative design process for turbine siting, access road and collector / transmission routing and the identification of substation, tap-in location, construction laydown and temporary use locations.

Parts of the Project are located within 120 m of significant wetlands, woodlands, and wildlife habitat, as identified in **Table 5.9**. As such, an EIS is required to assess the potential negative environmental effects and identify mitigation measures designed to prevent or minimize potential negative effects.

The following sections provides an overview of the project components assessed as part of the EIS and a detailed description of the potential negative environmental effects, mitigation measures and monitoring plan to be implemented as part of this Project.

Given the diversity of natural heritage features, some of the features qualify as significant under multiple designations. For example, significant woodlands often exhibit criteria for significant wildlife habitat. Where a feature is considered significant for multiple natural heritage designations, the impacts and mitigation as they relate to each function are discussed within the analysis of impacts to the feature in **Section 6.2**.

6.1 PROJECT OVERVIEW

The Project Location generally consists of the following:

Long-term Land Use Components (for duration of operation; i.e. 20 years)

- 77 ENERCON E101 wind turbine generators (80 potential locations identified) with a rated capacity of 3.0 MW with a maximum installed nameplate capacity of 230 MW
  - Tower height: 124 m to 135 m
  - Blade length: 48.6 m
  - Rotor diameter: 101 m
  - Tip height: 174.6 m to 185.6 m
- Two transformer substations: approximately 100 m x 100 m
- Approximately 80 km of Access Roads: approximately 6m wide
- Approximately 180 km of above ground and/or underground collector lines(34.5kV)and fibre optic lines, to be located on private property (within 0.5 m wide trench in or adjacent to access roads) and within the municipal road allowance. For above ground collector lines, a minimum pole height of 19 m and maximum pole height of 30 m is expected with varied pole spacing up to 60 m.
- Approximately 44 km of aboveground and/or below ground 115kV transmission lines, to be located in municipal road allowances and on participating private properties. Poles for above ground collector lines will be up to 23 m in height with varied pole spacing from approximately 60m to 100m as required.
- Alternative collector and transmission line routes have also been included in this assessment to accommodate final routing and detailed design, with transmission line routing not to exceed 50 km.

Temporary Land Use Components (required only for construction of the Project)

- Construction laydown area at each turbine (120 m x 100 m) includes a turbine staging area for construction of the turbine foundation and assembly of the turbine base and rotor (nacelle and blades), and within the construction laydown area is a 25 m x 60 m crane pad to support the crane used for turbine construction.
- Staging areas for access roads: 20 m wide corridor to each turbine location (40 m at a turning radii), includes long term access road (approximately 6 m) and temporary staging (14 m) areas, and 15m wide access road entrances off municipal roads.
- Along roadside collector lines, placed in the municipal road allowance, staging areas encompassing the entire municipal road allowance (10- 20 m) on each side of the road are being assessed for the purposes of this report.

- 2 potential construction laydown areas to be graded and graveled and returned to agricultural use upon completion of construction.

6.2 RESULTS

Significant natural features found in or within 120 m of the Project Location are shown on **Figures 7.1 – 7.58, Appendix A**. Based on the evaluation of significance, the following natural features have been identified as significant natural features in or within 120 m of the Project, for which an EIS is required:

- Wetlands – Ninety three (93) wetland features assessed by MNR as provincially significant (88). Sixty four (64) unevaluated wetlands(we1, we5, we20, we28, we47, we51, we94, we95, we118, we131, we147, we 150, we160, we164, we166, we186, we202, we210, we216, we218, we222, we231, we237, we240, we269, we276, we292, we299, we303, we304, we308, we309, we311, we314, we320, we322, we344, we356, we358, we364, we365,we373, we376, we377, we380, we383, we384, we385, we387, we389, we391, we392, we393, we395, we396, we398, we402, we403, we404, we409, we414, we425, we426 and we434) treated as significant for the purposes of this report.
- Woodlands – wo5, wo14, wo15, wo22, wo24, wo25, wo35, wo36, wo43, wo44, wo45, wo46, wo47, wo49, wo50, wo52, wo55, wo58, wo61, wo62, wo63, wo66, wo67, wo68, wo69, wo74, wo80, wo82, wo83, wo85, wo86, wo88, wo89, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo104, wo105, wo106, wo107, wo108, wo109, wo111, wo112, wo113, wo114, wo115, wo119, wo121, wo124, wo126, wo127, wo129, wo132, wo135, wo136, wo138, wo139, wo140, wo141, wo142, wo144, wo145,wo149, wo150, wo151, wo153, wo154, wo156, wo160, wo163, wo170, wo172, wo173, wo176, wo177, wo178, wo179, wo180, wo183, wo184, wo185, wo190, wo191, wo194, wo195, wo196, wo198, wo199, wo206, wo208, wo212, wo213, wo216, wo217, wo218, wwo220, wo221 and wo223.
- Landbird Migratory Bird Area – misa1, misa2 misa3, misa4
- Winter Raptor Areas – wr1, wr2, wr3, wr4
- Bat Maternity Colonies – bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55
- Snake Hibernacula – sh2, sh3, sh4, sh6, sh7
- Turtle Nesting Habitat - th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69
- Rare Vegetation Communities – rv2, rv3
- Amphibian Woodland Breeding Habitat – ah2, ah3, ah9, ah29, ah31, ah34, ah37, ah38, ah45, ah47, ah49, ah57, ah61, ah64, ah65, ah66, ah70, ah74, ah75, ah79, ah89
- Amphibian Wetland Breeding Habitat – ah25, ah32, ah35, ah55, ah83
- Species of Special Concern

- Short-eared Owl – wr1, wr2, wr4
- Snapping Turtle - th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69
- Milksnake – sh2, sh3, sh4, sh6, sh7
- Ribbonsnake - sh2, sh3, sh4, sh6, sh7
- Small-footed Bat - bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55
- Eastern Pipistrelle - bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55
- ANSIs
    - The provincially significant South St. Anne Slough Forest Life Science ANSI; and
    - The provincially significant Winger Earth Science ANSI
- Specialized Provincial Plans – Significant natural features within the Protected Countryside of the Greenbelt and Niagara Escarpment Plan Area.

The following sections provide a detailed description of the potential negative environmental effects of the Project, appropriate mitigation measures and a description of how the environmental effects monitoring plan and construction plan will address any negative environmental effects (O. Reg. 359/09, s. 38(2)(a)). Distances for any project component within 120 m of a significant natural feature are provided in the tables below.

The Natural Heritage Reference Manual (2010), the Significant Wildlife Habitat Technical Guide (MNR, 2000) and the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2012) in addition to relevant scientific literature and knowledge were used to assist in the evaluation of impacts and mitigation measures.

6.3 EIS OVERVIEW

The potential impacts associated with the proposed construction of the project components are identified and assessed in this section of the EIS, with appropriate mitigation, restoration and enhancement measures recommended to protect, and where feasible enhance, the natural heritage features and ecological functions. General impacts and standard mitigation measures to be implemented for this Project are provided, followed by an assessment of specific impacts and mitigation measures related to where project components occur within 120 m of specific types of significant natural features.

6.3.1 General Construction Mitigation Measures

The following section provides best management practices and other mitigation 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 project components.

6.3.1.1 Vegetation Removal

Natural features where habitat will be removed include grasslands 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 migratory 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.
- All disturbed areas of the construction site will be re-vegetated to pre-disturbance conditions as soon as conditions allow.
- All seeding and /or replanting of disturbed areas will use species native to Ecoregion 7E (or returned to agricultural operations) following 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. Once the laydown areas are no longer required, vegetation will be surveyed to assess damage and the potential for natural regeneration.

6.3.1.2 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.

Erosion susceptibility in this area is relatively low. Due to the flat topography of the area, there are no steep or elongated slopes that would accelerate runoff during a storm event. As such, the risk of erosion and resulting sedimentation within downstream natural features is limited,

although not absent. As such, standard erosion and sediment controls will be installed during construction to minimize potential impacts.

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 Niagara Region 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 inspected daily or immediately following a rain event during construction and weekly following construction until the site is stabilized to ensure their effectiveness at protecting the adjacent significant natural features.

6.3.1.3 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 greater than 30m from any natural feature 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 dewatering sediment control structures will be inspected immediately prior to and following the commencement of pumping activities with on-going inspection to be undertaken by the contractor while pumping occurs. Any repairs or maintenance will be completed as necessary to ensure the continuous functions of these protection measures;
- All water pumped during dewatering activities will be directed greater than 30m 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 Niagara Region Wind Farm Construction Plan Report (separate cover, Stantec 2012b).

6.3.1.4 Directional Drilling

Where collector and / or transmission lines are proposed to be installed beneath a wetland and/or woodland area, the method in construction will be via direction drilling or boring. No open cut installation of these buried project components will occur in a natural feature.

Erosion control devices will be installed at the drill location and drill cuttings will be collected and removed from the site for disposal in an approved and appropriate manner. An entrance and exit pit will be excavated outside of the wetland and woodland boundary ensuring that no encroachment into the significant feature. The following mitigation measures will be implemented:

- no clearing of vegetation will occur for drilling;
- drilling equipment will be set up and all drilling will be conducted a minimum of 30 m from the edge of the feature and 30 m away from the wetland boundary, where feasible;

- all drilling will occur at a depth of 3 m, or as close to this depth as construction and site conditions allow;
- prior to drilling, sediment control fencing will be installed at feature edges that occur within 30 m of drilling activities;
- topsoil stripped from the drill exit site must be stockpiled in a location designated by the Inspector;
- the topsoil stockpile must be located greater than 30m from the feature;
- any required dewatering associated with this process will follow the mitigation measures outlined in section 6.3.1.3;
- all fuel storage and refueling activities will occur greater than 30m from the feature;
- in the event of an accidental spill, spill response kits will be available on site. The MOE Spills Action Centre will be contacted as appropriate and emergency spill procedures will be implemented immediately; and
- construction machinery should be checked for presence of wildlife (i.e., reptiles) daily prior to operating machinery.

In the event of an inadvertent return of drilling lubricant (i.e. a frac-out) during drilling beneath a woodland or wetland feature, preventive and responsive measures as outlined in a Frac-out Response Plan will be implemented immediately and will include the following;

- Isolate the area with hay bales, sand bags or silt fencing will be used to surround and contain the drilling mud.
- The Ministry of the Environment will be consulted regarding the next appropriate action, which may include using a mobile vacuum truck to pump the drilling mud from the contained area and recycled to the return pit or leaving the drilling mud in place to avoid potential damage from vehicles entering the area.
- Once excess drilling mud is removed, the area will be seeded and/or replanted using native species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.
- Re-vegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm re-vegetation is successful. If re-vegetation is unsuccessful, additional measures will be taken to restore the vegetation, including removal and replacement (using local soils) of existing substrate in the affected area.

6.4 WETLANDS

No significant wetlands occurred in the Project Location. A total of eighty-eight (88) wetlands identified by the MNR as provincially significant were identified within 120 m of the Project Location.

Sixty-four (64) unevaluated wetland features were considered significant for the purposes of the NHA and project siting (refer to the Evaluation of Significance; Section 5.2.1), and require an EIS to identify and assess potential impacts and recommend appropriate mitigation measures and follow-up monitoring. These wetlands are shown in Figures 7.5 – 7.58, Appendix A.

No project components are proposed in or on a significant wetland. Underground collector lines are proposed to be directionally drilled under 10 wetland features (we100, we234, we240, we286, we292, we317, we402, we403, we407 and we423) on private property. Alternatively, the collector and transmission line crossing of the Welland River (we423) and the collector line crossing of the Welland Feeder Canal (we407) may be constructed on overhead poles instead of directional drill under these wetlands.

In the event that these collector and transmission lines will span these wetland features, the potential risks associated with directional drilling (frac out) would be avoided. Pole structures supporting an overhead line would be located outside of the wetland feature. The preferred construction methodology for the transmission and collector line crossing of the Welland River and the Feeder Canal will be determined by the contractor prior to construction. Project components found within 120 m of each wetland feature are detailed below.

All project components that are located > 0.1 m from significant wetland features are immediately adjacent to the wetland feature and not within the wetland feature

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
we1	0.69	• Transmission Line	• 2.4
we4	94.8	• Transmission Line	• 1.1
we5	0.87	• Transmission Line	• 10.9
we6	4.23	• Transmission Line	• 3.0
we15	15.76	• Transmission Line	• 3.6
we19	6.19	• Access Road • Collector Line	• 48.1 • 55.1
we20	0.63	• Collector Line	• 12.4
we24	14.81	• Access Road • Collector Line • Laydown Area • T79 • T80	• 0.1 • 5.7 • 1.0 • 50.8 to turbine base (13.8 to blade tip) • 47.7 to turbine base (11.7 to blade tip)
we25	15.32	• Access Road • Collector Line • Transmission Line	• 0.1 • 1.7 • 1.7
we26	3.71	• Collector Line	• 9.2

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
we28	1.15	• Collector Line	• 13.4
we34	0.90	• Collector Line	• 83.2
we37	0.66	• Collector Line	• 13.5
we41	5.75	• Collector Line	• 11.2
we47	1.64	• Access Road • Collector Line	• 61.4 • 1.8
we50	40.16	• Access Road • Collector Line	• 0.1 • 6.1
we51	2.21	• Collector Line	• 8.5
we60	4.58	• Collector Line	• 11.8
we62	8.78	• Access Road • Collector Line • Laydown Area • T94	• 48.4 • 32.8 • 28.1 • 45.9 to turbine base (9.9 to blade tip)
we68	0.97	• Access Road • Collector Line • Laydown Area	• 0.1 • 10.6 • 86.9
we77	6.741	• Collector Line	• 10.5
we84	57.84	• Collector Line	• 21.8
we86	6.53	• Collector Line	• 4.4
we87	47.14	• Access Road • Collector Line • Laydown Area • T56	• 69.7 • 5.9 • 27.2 • 67.2 to turbine base (31.2 to blade tip)
we90	80.29	• Collector Line • Transmission Line	• 10.3 • 7.4
we91	9.67	• Access Road • Collector Line	• 33.5 • 7.8
we94	1.00	• Collector Line	• 8.7
we95	0.71	• Collector Line	• 8.7
we99	32.36	• Collector Line	• 6.8
we100	31.76	• Access Road • Collector Line (directionally drilled under wetland) • Laydown Area • T66 • T94	• 0.1 • 0.1 • 0.1 • 39.4 to turbine base (3.4 to blade tip) • 77.2 to turbine base (41.2 to

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
			blade tip)
we101	50.59	• Access Road • Collector Line • Laydown Area • T66	• 30.2 • 4.2 • 36.6 • 96.3 to turbine base (60.3 to turbine blade)
we106	21.6	• Collector Line	• 0.1
we118	0.78	• Transmission Line	• 7.3
we124	235.49	• Access Road • Collector Line • Laydown Area • T06 • T27	• 22.0 • 4.0 • 0.1 • 63.1 to turbine base (27.1 to blade tip) • 39.5 to turbine base (3.5 to blade tip)
we131	1.51	• Collector Line	• 14.5
we147	0.62	• Collector Line	• 8.5
we150	1.85	• Collector Line	• 2.9
we152	2.51	• Access Road • Collector Line • Laydown Area • T60	• 21.6 • 56.6 • 11.0 • 44.1 to turbine base (8.1 to blade tip)
we156	0.99	• Access Road • Collector Line • Laydown Area • T04	• 50.4 • 60.4 • 10.2 • 47.9 to turbine base (11.9 to blade tip)
we160	0.74	• Collector Line • Transmission Line	• 39.5 • 8.0
we164	1.93	• Collector Line	• 6.6
we166	2.40	• Access Road • Collector Line	• 0.1 • 3.7
we167	20.96	• Access Road • Laydown Area	• 70.7 • 66.3
we170	32.06	• Collector Line	• 4.9
we171	48.88	• Collector Line	• 51.1
we174	1.07	• Collector Line	• 72.4

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
we176	5.49	• Access Road • Collector Line	• 3.8 • 12.7
we181	9.52	• Transmission Line	• 9.9
we182	19.27	• Access Road • Collector Line • Laydown Area • T81	• 89.7 • 99.7 • 41.5 • 87.2 to turbine base (51.2 to blade tip)
we183	2.28	• Access Road • Collector Line • Laydown Area • T93	• 89.7 • 80.2 • 32.1 • 67.7 to turbine base (31.7 to blade tip)
we184	45.46	• Collector Line • Laydown Area • Transmission Line	• 8.8 • 119.9 • 9.6
we186	0.59	• Collector Line	• 6.5
we202	0.94	• Access Road • Collector Line	• 0.1 • 12.4
we210	1.24	• Transmission Line	• 10.6
we216	0.87	• Collector Line	• 8.5
we218	0.92	• Collector Line	• 3.7
we220	47.07	• Access Road • Collector Line • Laydown Area • T18	• 0.1 • 0.1 • 0.1 • 40.9 to turbine base (4.9 to blade tip)
we222	0.50	• Collector Line • Transmission Line	• 53.6 • 5.7
we226	7.40	• Access Road • Collector Line • Laydown Area • T02	• 79.6 • 81.3 • 31.7 • 77.1 to turbine base (41.1 to blade tip)
we227	20.04	• Access Road • Collector Line • Laydown Area • T53	• 49.1 • 58.8 • 10.1 • 46.6 to turbine base (10.6 to blade tip)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
we229	9.35	• Access Road • Collector Line • Laydown Area • T31	• 41.7 • 51.7 • 0.1 • 39.2 to turbine base (3.2 to blade tip)
we230	2.43	• Access Road • Collector Line • Laydown Area • T31	• 85.8 • 95.8 • 46.0 • 83.3 to turbine base (47.3 to blade tip)
we231	2.98	• Collector Line • Transmission Line	• 6.7 • 1.5
we232	29.20	• Access Road • Laydown Area	• 119 • 99.0
we233	5.05	• Access Road • Collector Line • Laydown Area • T54	• 44.7 • 54.7 • 22.7 • 42.2 to turbine base (6.2 to blade tip)
we234	6.68	• Access Road • Collector Line • Laydown Area • T01	• 90.1 • 0.1 • 51.0 • 87.6 to turbine base (52.1 to blade tip)
we235	9.86	• Collector Line • Laydown Area • T38	• 100.6 • 59.8 • 95.5 to turbine base (59.5 to blade tip)
we237	1.38	• Access Road • Collector Line • Laydown Area • T33	• 0.1 • 7.7 • 26.2 • 63.6 to turbine base (27.6 to blade tip)
we240	0.91	• Access Road • Collector Line (directionally drilled under wetland) • Fibre Optic Line • Laydown Area	• 60.9 • 0.1 • 107.2 • 114.7
we242	3.67	• Access Road • Collector Line • Laydown Area • T97	• 86.7 • 96.7 • 66.0 • 84.2 to turbine base (48.2 to

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
			blade tip)
we244	58.77	• Access Road • Collector Line • Laydown Area • T97	• 99.4 • 6.7 • 50.5 • 96.6 to turbine base (60.6 to blade tip)
we253	4.65	• Collector Line	• 6.3
we260	9.90	• Access Road • Collector Line • Laydown Area • T08	• 34.7 • 48.7 • 8.2 • 42.8 to turbine base (6.8 to blade tip)
we263	2.56	• Collector Line	• 4.8
we268	18.27	• Access Road • Collector Line • Laydown Area • T78	• 11.4 • 2.3 • 48.4 • 88.4 to turbine base (52.4 to blade tip)
we269	0.51	• Collector Line	• 33.2
we275	4.95	• Access Road • Collector Line • Laydown Area • T08	• 51.5 • 61.5 • 1.4 • 49.0 to turbine base (13.0 to blade tip)
we276	1.29	• Collector Line • Transmission Line	• 4.6 • 13.2
we279	3.30	• Collector Line	• 1.6
we281	2.21	• Access Road • Collector Line • Laydown Area • T55	• 55.3 • 64.9 • 28.9 • 52.8 to turbine base (16.8 to blade tip)
we282	6.25	• Access Road • Collector Line • Laydown Area • T32	• 2.5 • 36.3 • 0.1 • 61.1 to turbine base (25.1 to blade tip)
we284	3.33	• Access Road • Collector Line	• 20.3 • 30.7

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
		• Laydown Area	• 60.6
we286	10.04	• Collector Line (directionally drilled under wetland) • Laydown Area	• 0.1 • 116.0
we288	22.59	• Access Road • Collector Line	• 92.1 • 0.1
we292	0.64	• Access Road • Collector Line (directionally drilled under wetland) • Laydown Area • T32	• 2.3 • 0.1 • 0.1 • 73.1 to turbine base (37.1 to blade tip)
we294	2.10	• Access Road • Collector Line • Laydown Area • T39	• 44.2 • 54.2 • 23.1 • 41.7 to turbine base (5.7 to blade tip)
we295	30.34	• Laydown Area	• 114.0
we299	1.03	• Access Road • Collector Line	• 81.0 • 1.0
we303	0.53	• Collector Line	• 5.2
we304	0.53	• Collector Line	• 5.7
we308	0.68	• Collector Line	• 7.22
we309	8.81	• Collector Line • Transmission Line	• 5.6 • 5.6
we310	3.36	• Collector Line	• 8.4
we311	0.94	• Collector Line	• 4.4
we312	2.78	• Collector Line	• 4.5
we314	1.84	• Collector Line	• 2.6
we315	11.57	• Access Road • Collector Line	• 8.1 • 1.4
we317	1.25	• Collector Line (directionally drilled under wetland)	• 0.1
we320	1.34	• Collector Line	• 2.5
we322	3.012	• Collector Line	• 55.9
we324	14.42	• Collector Line	• 9.2
we326	10.63	• Collector Line	• 1.4
we329	49.174	• Access Road • Collector Line	• 53.0 • 5.0

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
		• Transmission Line	• 111.0
we332	4.40	• Access Road • Collector Line • Laydown Area • T74	• 67.5 • 77.5 • 21.1 • 65.0 to turbine base (29.0 to blade tip)
we336	61.22	• Access Road • Collector Line • Fibre Optic Line • Laydown Area • Transmission Line • T36	• 60.1 • 0.6 • 17.1 • 23.7 • 65.5 • 57.6 to turbine base (21.6 to blade tip)
we340	85.39	• Access Road • Collector Line • Laydown Area • T09 • T51	• 46.3 • 34.8 • 0.9 • 43.8 to turbine base (7.8 to blade tip) • 52.5 to turbine base (16.5 to blade tip)
we342	18.21	• Transmission Line	• 0.8
we344	0.85	• Transmission Line • Collector Line	• 18.0 • 18.0
we349	3.91	• Transmission Line • Collector Line	• 0.1 • 0.1
we351	56.86	• Collector Line • Transmission Line	• 13.1 • 13.1
we353	22.91	• Collector Line • Transmission Line	• 5.2 • 61.0
we356	0.81	• Collector Line • Transmission Line	• 1.3 • 1.3
we357	198.84	• Access Road • Collector Line • Laydown Area • Transmission Line	• 116.6 • 115.8 • 82.1 • 7.6
we358	1.32	• Collector Line • Transmission Line	• 7.5 • 7.5
we360	27.78	• Access Road • Collector Line	• 0.1 • 5.7

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
		• Transmission Line	• 5.2
we361	32.58	• Access Road • Collector Line • Laydown Area • Transmission Line • T10	• 36.4 • 78.2 • 53.2 • 14.6 • 100.5 to turbine base (64.5 to blade tip)
we364	0.69	• Collector Line • Transmission Line	• 0.1 • 39.6
we365	0.60	• Collector Line • Transmission Line	• 6.0 • 6.0
we373	18.60	• Collector Line • Fibre Optic Line • Laydown Area	• 109.6 • 110.4 • 98.2
we376	1.72	• Collector Line • Transmission Line	• 14.2 • 8.9
we377	1.90	• Collector Line • Transmission Line	• 4.6 • 5.4
we380	0.61	• Collector Line • Transmission Line	• 13.6 • 15.6
we381	3.50	• Collector Line • Transmission Line	• 10.4 • 9.1
we382	8.54	• Access Road • Collector Line • Transmission Line	• 0.1 • 6.0 • 5.9
we383	0.93	• Collector Line	• 9.7
we384	0.94	• Collector Line	• 7.7
we385	0.89	• Collector Line	• 9.3
we387	0.65	• Collector Line	• 10.2
we389	1.43	• Access Road • Collector Line • Laydown Area • T42	• 33.8 • 80.6 • 27.5 • 68.1 to turbine base (32.1 to blade tip)
we391	1.26	• Collector Line	• 6.3
we392	1.98	• Access Road • Collector Line	• 83.9 • 91.7
we393	0.68	• Access Road • Collector Line	• 2.5 • 14.6

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
we395	0.81	• Collector Line	• 8.9
we396	57.32	• Collector Line • Laydown Area	• 14.1 • 95.5
we397	27.46	• Access Road • Collector Line • Laydown Area • T24	• 42.6 • 52.6 • 21.8 • 40.1 to turbine base (4.1 to blade tip)
we398	1.97	• Access Road • Collector Line	• 3.5 • 9.7
we399	21.95	• Access Road • Collector Line • Laydown Area • T24	• 24.7 • 55.3 • 5.6 • 42.8 to turbine base (6.8 to blade tip)
we402	1.97	• Collector Line (directionally drilled under wetland)	• 0.1
we403	12.39	• Access Road • Collector Line (directionally drilled under wetland) • Laydown Area	• 0.1 • 0.1 • 71.1
we404	21.47	• Access Road • Collector Line • Laydown Area • T20	• 17.3 • 6.6 • 17.2 • 89.0 to turbine base (53.0 to blade tip)
we405	0.98	• Access Road • Collector Line • Laydown Area • Laydown Area • T16	• 0.1 • 1.6 • 119.4 • 14.6 • 87.0 to turbine base (51.0 to blade tip)
we407	21.01	• Collector Line (directionally drilled under wetland)	• 0.1
we408	129.89	• Access Road • Collector Line • Laydown Area • T14 • T16 • T44	• 0 • 0.1 • 12.9 • 72.9 to turbine base (36.96 to blade tip) • 92.6 to turbine base (56.6 to blade tip) • 76.0 to turbine base (40.0 to

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m	Approximate closest point (m)
		• T45 • T47	blade tip) • 39.9 to turbine base (3.9 to blade tip) • 100.9 to turbine base (64.9 to blade tip)
we409	9.94	• Access Road • Collector Line • Laydown Area • T21 • T22 • T61	• 10.0 • 0.1 • 2.4 • 51.3 to turbine base (15.3 to blade tip) • 45.5 to turbine base (9.5 to blade tip) • 48.0 to turbine base (12.0 to blade tip)
we414	0.58	• Transmission Line	• 41.1
we418	0.88	• Transmission Line	• 61.7
we420	0.79	• Transmission Line	• 104.9
we423	14.32	• Collector Line • Transmission Line	• 0.1 • 0.1
we425	1.54	• Collector Line	• 64.8
we426	1.71	• Collector Line	• 8.4
we427	9.76	• Collector Line	• 7.0
we433	3.30	• Collector Line	• 24.4
we434	0.85	• Collector Line	• 9.9
we436	22.83	• Collector Line	• 7.3
we440	15.33	• Collector Line	• 4.0
we441	2.74	• Collector Line • Transmission Line	• 0.1 • 0.1

Potential Effects

No components of the Project are located within the significant wetland boundaries as identified and confirmed through site investigations. As the Project Location is sited outside all significant wetland boundaries, there will be no direct loss of significant wetland habitat or function as a result of the Project. Indirect impacts resulting from construction and decommissioning activities, such as dust generation, sedimentation, accidental intrusion and vegetation removal,and erosion are expected to be short term, temporary in duration and mitigated for through the use of standard site control measures. During construction and decommissioning, there will be increased traffic and the potential for accidental spills.

Wetlands adjacent to collector lines and Transmission lines

All construction of the collector line system will occur outside of wetland boundaries. The Collector line system is within 120m of140wetland features, 73 of these are overhead collector lines to be located within the road right-of-way and 67 are proposed underground collector lines. Of the 73 wetlands within 120m of overhead collector lines, 55 have the collector line as the only component within 120m of the wetland.

The overhead collector line is within 1m of wetland features we106, we317, we364, and we402. The remaining placement of roadside collector lines within the existing municipal road allowance will occur more than 1.3 m from wetland feature boundaries.

Underground collector lines will be installed using a trenching machine, which will occur within 120m of 67 wetland features and within 1m of wetland boundaries in existing agricultural areas adjacent to features we220, we288, we336, we405, we408, we409) and by horizontal directional drill (HDD) under 11 wetland features (we100, we234, we240, we286, we308, we317, we402, we403, we405, we407 and we423). Directional drilling in plastic conduits will be used where underground cables cross beneath natural features, public roads or other obstacles.

The Transmission line, proposed entirely within the road right-of way, is within 120m of 40 wetland features and within 1m of featurewe349. The Transmission line is the only Project component sited within 120m of wetland features we1, we4, we5, we6, we15, we118, we181, we210, we342, we344, and we349.

All construction activities will be conducted from vehicles parked in the right-of-way. Construction activities during the installation of the collector and transmission line are anticipated to be low impact and short term in duration.

There will be no clearing of trees in or near any of the wetland features that could result in wetland desiccation or drying. The risk of accidental intrusion and vegetation removal will be minimized through demarcation of work areas, as described below. No known microhabitat changes have been identified as a result of wind turbines and ancillary infrastructure.

During operation of the facility, there will be no discharge of lubricating oils and other fluids (i.e. hydraulic fluids) from the turbines because the Enercon E101 turbines selected for this project do not contain such fluids.

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 ground water changes).

The wetland units are located adjacent to county roads and currently experience impacts from current day to day use and maintenance of the roadway. During operation there may be

occasional system maintenance to the collector line, but regular impacts from the current day to day use of the road system and maintenance activities associated with the road and existing transmission lines (where they occur) are expected to have higher impacts.

Wetlands within 120m of turbines and access roads

Changes in surface water drainage can affect wetlands. Access roads and turbines (including temporary laydown areas) are located within 120m of 66 wetland features. Access roads are located within 0.5mof wetland features we50, we68, we100, we166, we202, we220, we237, we360, and we405. All other access roads are sited greater than 1.9m from wetland boundaries with access road located within 30m of 26 wetland features.

Access roads would be narrow, relatively flat, unpaved roads that would receive relatively little regular traffic. Mitigation measures will be implemented to ensure there is no alteration of surface runoff quantity and patterns.

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.

The proposed development plan may slightly alter surface water inputs to the wetland. New access roads and infrastructure can alter surface flow, and the small increase in hard surface area could result in increased run-off quantities during precipitation events. The percent area converted to hard surfaces is negligible and no effect to the water balance is anticipated. In some instances, new access roads cross drainage features in the upstream catchment of wetlands. Construction of these crossings may disrupt the quality of surface water input to wetlands. Consideration of these crossings is also required to maintain existing flow conditions through the duration of the Project.

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, and create opportunities for the introduction and spread of invasive species in nearby wetland units. The effect is somewhat minimized by habitat preferences of invasive species; i.e., new edges will be created in upland communities only.

Directional Drill

The primary potential impacts to Features we100, we240, we286, we292, we308, we317, we402we403we407 and we423 from directional drilling are erosion, sediment deposition and damage to the structural roots of the trees. Given the temporary nature of the increased activity, the relatively short duration of activities, the location of the activities (within actively

managed agricultural fields) and the erection of barrier fencing (i.e. silt fencing), the risk of increased mortality to wildlife during construction of the line is considered low.

Collector Lines and Transmission Lines over wetlands

As an alternative to directional drill under the Welland River (we407) and the Welland feeder canal(we423), the option to install the lines over these features is being considered as part of this EIS. Given that the Welland River PSW and Welland Feeder Canal PSW span the entire width of the Project Study Area (east to west), options to avoid crossing these features did not exist.

No poles are proposed within the wetland to avoid the direct loss of wetland habitat and to minimize impacts during construction. Potential impacts from construction activities outside of the wetlands are less of a concern but may include erosion and sediment deposition. By avoiding the construction of poles within the wetland and given the temporary nature of the increased activity, the relatively short duration of activities, the location of the activities (within actively managed agricultural fields) and the erection of barrier fencing (i.e. silt fencing), the risk of impacts to the wetland features is considered low.

The determination of whether the transmission and collector lines will be installed overhead or beneath these wetland features will be confirmed during detailed design, although impacts associated with both construction method have been assessed in the NHA/EIS.

Proposed Mitigation

Avoidance was the main strategy used to minimize impacts to wetland habitat within 120 m of the Project Location. All components of the Project are sited outside the wetland feature boundaries. Standard best management practices will be applied to all construction activities:

- No development is permitted within the significant wetland boundaries.
- The boundaries of all wetlands within 30 m of the proposed construction area will be flagged / staked in the field by a qualified ecologist prior to construction to assist with the demarcation of the construction area, to ensure construction activities avoid these sensitive areas and to assist with the proper field installation of E&S controls;
- Silt barriers (e.g., fencing) will be erected along the edge of all wetland boundaries where they are located within 30m of construction areas (including staging and laydown areas). These barriers will be monitored daily during constructionand after periods of high precipitation and bi-weekly following construction and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation. Additional mitigation measures for sediment and erosion control will be implemented as outlined in Section 5.4.1.2
- In the event of accidental damage to trees, or unexpected vegetation removal, these disturbed areas will be restored to pre-existing conditions through the seeding or

planting of species native to Ecoregion 7E. Any trees damaged during construction would be inspected by a qualified arborist and appropriate measures implemented at their direction.

- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur greater than 30mfrom all wetlands. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas greater than 30m from a wetland.
- Where possible, and as appropriate, access roads will be constructed at or near existing grade to maintain surface flow contributions to wetlands.
- Culverts will be installed at all watercourse crossings. Equalization culverts have also been proposed to accommodate surface water runoff from swales that extend across existing agricultural fields. These culverts will be designed to convey flows in a manner that minimizes erosion and avoids flooding of downstream wetlands.
- General mitigation measures for directional drill as outlined in Section 6.3.1.4

Net Effects

No components of the Project are located within the significant wetland boundaries and as such there will be no direct loss of significant wetland habitat or function as a result of the Project. Indirect impacts resulting from construction and decommissioning activities, such as dust generation, sedimentation, and erosion are expected to be short term, temporary in duration and mitigated for through the use of standard site control measures.

Significant wetlands adjacent to existing municipal roads currently experience disturbance from ongoing use of the road and associated maintenance. The brief and low impact nature of construction and decommissioning activities required within the municipal road allowance required for the Project and the low impact during Project operation would result in minimal negative impacts to these wetlands. Once construction is complete, the only impact associated with the operation of the collector and transmission lines would be tree trimming associated with on-going maintenance activities.

Significant wetlands adjacent to agricultural fields currently experience disturbance from activities such as plowing, planting, spraying and other disturbances that affect the wetland edge communities. These communities are accustomed to some level of disturbance. While some impacts may occur temporarily during construction, appropriate mitigation measures will be implemented to minimize such impacts.

Based on the potential effects on significant wetlands from wind turbines and access roads and the effectiveness of proposed mitigation measures, there would be minimal effects from the Project on wetlands.

6.5 WOODLANDS

A total of 104significant woodlands occur in or within 120 m of the Project Location (Section 6.2).

No project components are proposed in, on, or over a significant woodland. Underground collector lines are proposed to be directionally drilled under 7 woodland features (wo66, wo105, wo119, wo191, wo113, wo153 and wo194). Significant woodlands within 120 m of the Project Location are shown on **Figures 7.1 – 7.58 (Appendix A)** and indicated in **Table 5.2 (Appendix B)**.

Project components found in or within 120 m of each significant woodland are detailed below. All project components that are located > 0.1 m from significant woodland features are immediately adjacent to the woodland feature and not within the woodland feature.

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wo5	119.96	• Transmission Line (0.3m)
wo14	9.25	• Transmission Line (14.5m)
wo15	14.14	• Transmission Line (12.5m)
wo22	50.21	• Transmission Line (0.8m, 11.2m)
wo24	3.75	• Transmission Line (10.7m)
wo25	12.17	• Transmission Line (51.2m)
wo35	176.13	• Access Road (58.7m) • Collector Line (15.9m, 95.7m, 86.2m, 15.7m) • Fibre Optic Line (15.9m, 86.2m)
wo36	14.86	• Access Road (45.2 m) • Collector Line (55.2m) • Laydown Area (within 0.5m) • T80 (42.7m to turbine base, 6.7m to blade tip) • Fibre Optic Line (55.2m)
wo43	25.52	• Access Road (within 0.5m) • Collector Line (within 0.5m, 7.7m, 6.0m, 6.3m) • Laydown Area (within 0.5m, 1.0m) • T79 (45.3m to turbine base, 9.3m to blade tip) • T80 (47.7m to turbine base, 11.7m to blade tip) • Fibre Optic Line (within 0.5m, 6.0m, 7.7m)
wo44	2.03	• Access Road (58.8m) • Collector Line (115.2m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
		• Laydown Area (114.9m) • Fibre Optic Line (115.2m)
wo45	3.95	• Collector Line (9.7m, 9.2m) • Fibre Optic Line (9.7m)
wo46	13.36	• Collector Line (13.7m, 13.8m) • Fibre Optic Line (13.7m)
wo47	22.72	• Collector Line (101.7m) • Transmission Line (101.7m) • Fibre Optic Line (101.7m)
wo49	11.68	• Transmission Line (3.0m, 59.5m)
wo50	7.28	• Collector Line (11.2m, 11.4m) • Fibre Optic Line (11.2m)
wo52	39.83	• Access Road (within 0.5m) • Collector Line (6.1m, 9.4m) • Fibre Optic Line (6.1m)
wo55	13.33	• Access Road (48.4m) • Collector Line (58.4m, 6.8m) • Fibre Optic Line (58.4m) • Laydown Area (28.1m) • T94 (45.9m to turbine base, 9.9m to blade tip)
wo58	9.47	• Collector Line (11.8m) • Fibre Optic Line (11.8m)
wo61	12.14	• Access Road (8.9m) • Collector Line (7.8m, 52.4m, 52.7m, 54.8m, 9.1) • Fibre Optic Line (7.8m, 52.4m)
wo62	92.13	• Collector Line (8.2m, 22.7m) • Transmission Line (11.3m) • Fibre Optic Line (22.7m, 8.2m)
wo63	105.00	• Collector Line (2.9m, 3.2m, 44.5m) • Fibre Optic Line (2.9m, 44.5m)
wo66	39.74	• Access Road (4.7m) • Collector Line (0.0m) – directional drill under the woodland, (7.9m, 87.6m, 97.9m, 107.2m, 7.3m) • Laydown Area (10.6m, 59.5m) • T66 (94.7m to turbine base, 58.7m to blade tip) • T94 (94.2m to turbine base, 54.9m to blade tip) • Fibre Optic Line (within 0.5m, 7.3m, 97.9m, 7.9m, 107.2m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wo67	86.76	• Access Road (69.7m) • Collector Line (3.8m, 6.1m, 28.8m, 2.4m, 5.3m, 5.7m, 79.7m) • Laydown Area (27.2m) • T56 (85.2m to turbine base, 31.2m to blade tip) • Fibre Optic Line (3.8m, 28.8m, 6.1m, 5.3m, 5.7m, 79.7m)
wo68	40.72	• Collector Line (6.7m) • Fibre Optic Line (6.7m)
wo69	250.05	• Access Road (64.0m) • Collector Line (0.1m, 42.0m, 18.0m, 52.0m, 71.1m) • Laydown Area (0.1m, 74.7m, 111.1m) • T27 (39.5m to turbine base, 3.5m to blade tip) • Fibre Optic Line (0.1m, 71.1m, 18.0m, 52.0m))
wo74	1.56	• Access Road (23.7m) • Collector Line (74.9m, 76.3m) • Laydown Area (24.2m) • T60 (62.4m to turbine base, 26.4m to blade tip) • Fibre Optic Line (76.3m, 74.9m)
wo80	20.97	• Access Road (104.3m) • Laydown Area (98.9m, 112.7)
wo82	27.82	• Collector Line (29.1m, 23.4m) • Fibre Optic Line (29.1m)
wo83	76.37	• Collector Line (0.7m) • Fibre Optic Line (0.7m)
wo85	7.68	• Access Road (53.1m) • Collector Line (63.1m) • Laydown Area (12.4m) • T93 (50.6m to turbine base, 14.6m to blade tip) • Fibre Optic Line (63.1m)
wo86	4.21	• Access Road (3.8m) • Collector Line (12.7m, 28.2m) • Fibre Optic Line (12.7m)
wo88	41.56	• Access Road (33.3m) • Collector Line (55.2m) • Laydown Area (24.3m) • Transmission Line (37.9m) • T81 (42.7m to turbine base, 6.7m to blade tip) • Fibre Optic Line (55.2)
wo89	12.73	• Transmission Line (9.9m)
wo91	19.27	• Access Road (89.7m) • Collector Line (99.7m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
		• Laydown Area (41.5m) • T81 (87.2m to turbine base, 51.2m to blade tip) • Fibre Optic Line (99.7m)
wo92	2.46	• Access Road (93.5m) • Collector Line (103.5m) • Laydown Area (57.1m) • T93 (91.0m to turbine base, 55.0m to blade tip) • Fibre Optic Line (103.5m)
wo97	53.36	• Access Road (0.1m) • Collector Line (2.4m) • Laydown Area (0.1m) • T18 (40.9m to turbine base, 4.9m to blade tip) • Fibre Optic Line (2.4m)
wo98	11.84	• Access Road (79.6m) • Collector Line (57.4m) • Laydown Area (31.7m, 82.1m) • T02 (77.1m to turbine base, 41.1m to blade tip) • Fibre Optic Line (57.4m)
wo99	29.01	• Access Road (49.1m) • Collector Line (58.8m, 59.1m) • Laydown Area (10.1m) • T53 (46.6m to turbine base, 10.6m to blade tip) • Fibre Optic Line (58.8m, 59.1m)
wo100	11.26	• Access Road (41.7m) • Collector Line (51.7m) • Laydown Area (0.1m) • T31 (39.2m to turbine base, 3.2m to blade tip) • Fibre Optic (51.7m)
wo102	27.58	• Access Road (46.8m) • Collector Line (12.4m, 56.8m) • Laydown Area (22.6m) • T76 (44.3m to turbine base, 8.3m to blade tip) • Fibre Optic Line (12.4m, 56.8m)
wo103	3.16	• Access Road (67.1m, 114.2m) • Collector Line (0.3m) • Laydown Area (40.4m, 110.9m) • Fibre Optic Line (0.3m)
wo104	31.37	• Access Road (114.1m) • Laydown Area (92.9m)
wo105	16.45	• Collector Line (103.9m, within 0.5m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
		• Laydown Area (68.2m) • T01 (100.5m to turbine base, 64.5m to blade tip) • Access Road (103.0m) • Fibre Optic Line (103.9m)
wo106	10.62	• Laydown Area (79.6m)
wo107	4.03	• Access Road (90.1m) • Collector Line (100.1m) • Laydown Area (63.5m) • T97 (87.6m to turbine base, 51.6m to blade tip) • Fibre Optic Line (100.1m)
wo108	80.98	• Access Road (99.1m) • Collector Line (0.9m, 109.1m) • Laydown Area (50.5m) • T97 (96.6m to turbine base, 60.6m to blade tip) • Fibre Optic Line (109.1m, 0.9m)
wo111	20.77	• Access Road (34.7m) • Collector Line (48.7m) • Laydown Area (1.4m) • T08 (42.8m to turbine base, 6.8m to blade tip) • Fibre Optic Line (48.7m)
wo112	17.45	• Access Road (44.8m) • Collector Line (6.3m, 10.3m, 73.6m) • Fibre Optic Line (6.3m) • Laydown Area (13.3m) • T32 (61.1m to turbine base, 25.1m to blade tip) • Fibre Optic Line (73.6m)
wo113	26.79	• Access Road (11.4m) • Collector Line (0.0m) – directional drill under the woodland • Laydown Area (22.6m) • T78 (57.3m to turbine base, 21.3m to blade tip) • Fibre Optic Line (within 0.5m)
wo114	2.85	• Collector Line (88.6m) • Laydown Area (111.4m) • Fibre Optic Line (88.6m)
wo115	21.21	• Access Road (92.1m) • Collector Line (6.4m) • Fibre Optic Line (6.4m)
wo119	6.86	• Collector Line (0.0m)- directional drill under the woodland • Laydown Area (116.0m) • Fibre Optic Line (within 0.5m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wo121	29.59	• Collector Line (4.4m, 5.0m) • Fibre Optic Line (4.4m)
wo124	4.10	• Access Road (62.4m) • Collector Line (72.4m, 92.1m) • Fibre Optic Line (49.0m) • Laydown Area (30.8m) • T07 (59.9m to turbine base, 23.9m to blade tip)
wo126	3.36	• Collector Line (7.9m, 8.4m) • Fibre Optic Line (7.9m)
wo127	2.78	• Collector Line (4.5m, 8.6m) • Fibre Optic Line (4.5m)
wo129	12.36	• Access Road (8.1m) • Collector Line (1.4m, 50.8m, 50.7m, 51.3m, 4.8m) • Fibre Optic Line (50.8m, 1.4m, 50.7m)
wo132	20.73	• Collector Line (9.2m, 10.7m) • Fibre Optic Line (9.2m)
wo135	15.16	• Collector Line (1.2m, 1.1m, 18.0m, 4.1m, 2.7m, 96.1m) • Fibre Optic Line (96.1m, 1.2m, 2.7m, 4.1m)
wo136	5.35	• Access Road (53.0m) • Collector Line (6.9m, 3.1m, 95.2m, 93.6m, 93.3m) • Fibre Optic Line (6.9m, 93.6m)
wo138	23.66	• Access Road (54.8m) • Collector Line (64.8m) • Laydown Area (11.4m) • T29 (64.8m) • Fibre Optic Line (64.8m)
wo139	11.11	• Access Road (41.2m) • Collector Line (51.2m, 112.8m) • Fibre Optic Line (82.8m, 112.8m, 51.2m) • Laydown Area (9.7m) • T74 (38.7m to turbine base, 2.7m to blade tip)
wo140	3.64	• Collector Line (0.6m) • Fibre Optic Line (0.6m)
wo141	8.76	• Collector Line (61.8m, 62.0m) • Transmission Line (62.3m) • Fibre Optic Line (61.8m)
wo142	84.24	• Access Road (46.3m) • Collector Line (34.8m, 35.5m) • Laydown Area (0.9m) • T09 (43.8m to turbine base, 7.8m to blade tip)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
		• T51 (52.7m to turbine base, 16.7m to blade tip) • Fibre Optic Line (35.5m)
wo144	16.48	• Transmission Line (0.8m)
wo145	15.15	• Collector Line (71.7m, 58.0m, 79.4m, 72.5m) • Transmission Line (58.0m) • Fibre Optic Line (72.5m, 71.7m)
wo149	46.22	• Access Road (0.1m) • Collector Line (5.2m) • Transmission Line (5.2m, 5.4m, 5.0) • Fibre Optic Line (5.2m)
wo150	310.81	• Access Road (0.1m) • Collector Line (47.3m, 115.8m) • Laydown Area (15.9m) • T95 (78.1m to turbine base, 42.1m to blade tip) • Transmission Line (115.8m,9.1m) • Fibre Optic Line (115.8m, 47.3m)
wo151	32.15	• Access Road (67.1m) • Collector Line (81.4m, 107.2m) • Laydown Area (62.6m, 65.7m) • Transmission Line (107.2m, 14.6m) • T10 (100.5m to turbine base, 64.5m to blade tip) • Fibre Optic Line (107.2m)
wo153	25.98	• Access Road (51.3m, 43.6m, 2.2m) • Collector Line (0.0m) – directional drill under the woodland, (37.2m, 110.7m, 61.3m) • Laydown Area (8.1m, 14.0m, 8.6m) • Fibre Optic Line (within 0.5m, 110.7m, 61.3m, 37.2m) • T11 (64.2m to turbine base, 28.2m to blade tip) • T12 (58.8m to turbine base, 22.8m to blade tip) • T41 (98.2m to turbine base, 62.2m to blade tip)
wo154	21.25	• Access Road (73.1m) • Collector Line (82.5m, 83.1m, 83.2m) • Laydown Area (39.1m) • T91 (70.6m to turbine base, 34.6m to blade tip) • Fibre Optic Line (83.1m, 83.2m)
wo156	6.89	• Collector Line (4.0m, 5.3m, 27.3m) • Transmission Line (5.2m, 88.4m) • Fibre Optic Line (5.3m, 4.0m, 27.3m)
wo160	2.14	• Collector Line (13.6m) • Transmission Line (15.6m, 88.0m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
		• Fibre Optic Line (13.6m)
wo163	28.48	• Access Road (0.1m) • Collector Line (2.5m, 27.7m) • Transmission Line (3.5m, 29.1m, 6.7m, 111.1m) • Fibre Optic Line (2.5m, 27.7m)
wo170	3.79	• Access Road (0.1m) • Collector Line (6.8m, 65.1m, 73.7m,19.2m) • Fibre Optic (19.2m, 6.8m, 73.7m)
wo172	4.85	• Collector Line (20.5m, 22.2m) • Fibre Optic Line (22.2m, 20.5m)
wo173	2.54	• Collector Line (2.5m) • Transmission Line (0.1m) • Fibre Optic Line (2.5m)
wo176	5.56	• Access Road (52.4m) • Collector Line (60.8m) • Fibre Optic Line (60.8m)
wo177	11.18	• Access Road (3.7m) • Collector Line (14.3m) • Laydown Area (9.6m) • T84 (76.3m to turbine base, 40.3m to blade tip) • Fibre Optic Line (14.3m)
wo178	126.16	• Access Road (33.8m) • Collector Line (80.6m) • Laydown Area (27.5m) • T42 (68.1m to turbine base, 32.1m to blade tip) • Fibre Optic Line (80.6m)
wo179	31.34	• Collector Line (10.1m, 10.4m, 7.0m) • Fibre Optic Line (10.1m)
wo180	326.73	• Access Road (42.1m) • Collector Line (52.1m) • Laydown Area (0.1m) • T98 (39.6m to turbine base, 3.6m to blade tip) • Fibre Optic Line (582.1m)
wo183	116.99	• Access Road (0.1m, 110.7m) • Collector Line (7.8m, 5.9m, 10.3m, 14.1m, 14.3m, 17.1m, 17.4m) • Laydown Area (2.6m, 11.6m, 81.2m) • T62 (74.5m to turbine base, 68.5m to blade tip) • T63 (47.4m to turbine base, 11.4m to blade tip) • Fibre Optic (7.8m, 10.3m, 14.1m, 17.1m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wo184	46.93	• Access Road (42.6m) • Collector Line (52.6m) • Laydown Area (5.6m) • T24 (40.1m to turbine base, 4.1m to blade tip) • Fibre Optic Line (52.6m)
wo185	12.57	• Access Road (3.5m) • Collector Line (10.2m, 20.1m, 8.1m) • Fibre Optic (10.2m)
wo190	25.57	• Access Road (17.3m) • Collector Line (0.1m, 101.5m, 9.9m, 8.6m) • Laydown Area (17.2m) • T20 (89.0m to turbine base, 53.0m to blade tip) • Fibre Optic Line (0.1m, 8.6m, 101.5m, 9.9m)
wo191	22.99	• Access Road (0.1m) • Collector Line (0.0m) - directional drill under the woodland, (14.0m, 2.3m, 1.3m) • Laydown Area (71.1m) • Fibre Optic Line (0.1m)
wo194	221.91	• Access Road (0.1m) • Collector Line (0.0m) - directional drill under the woodland , (70.8m, 113.4m, 51.2m, 95.0m, 24.8m, 2.1m, 64.9m, 63.5m) • Fibre Optic Line (0.1m, 24.8m, 113.4m, 51.2m, 63.5m, 64.9m, 2.1m, 70.8) • Laydown Area (3.1m, 55.1m, 20.2m, 9.9m, 18.0m, 12.6m, 46.8m) • T14 (72.9m to turbine base, 36.9m to blade tip) • T16 (87.0m to turbine base, 51.0m to blade tip) • T21 (52.4m to turbine base, 16.4m to blade tip) • T44 (76.0m to turbine base, 40.0m to blade tip) • T45 (39.9m to turbine base, 3.9m to blade tip) • T47 (100.9m to turbine base, 64.9m to blade tip)
wo195	29.14	• Collector Line (10.3m) • Fibre Optic Line (10.3m)
wo196	9.18	• Access Road (67.1m) • Collector Line (77.1m) • Laydown Area (47.0m) • T05 (64.6m to turbine base, 28.6m to blade tip) • Fibre Optic Line (77.1m)
wo198	10.96	• Transmission Line (9.2m)
wo199	62.08	• Transmission Line (28.2m, 93.6m)
wo206	3.08	• Transmission Line (40.7m)

Feature Number	Feature Size (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wo208	23.60	• Collector Line (21.8m, 34.5m)
wo212	75.33	• Collector Line (64.8m)
wo213	4.51	• Collector Line (5.8m)
wo216	2.22	• Collector Line (10.7m)
wo217	31.01	• Collector Line (6.8m)
wo218	8.49	• Collector Line (9.2m)
wo220	3.04	• Collector Line (24.4m)
wo221	36.25	• Collector Line (7.3m)
wo223	2.20	• Collector Line (11.5m)

Potential Effects

No Project component is located in, on or over a significant woodland. With the exception of where collector lines are proposed beneath significant woodlands, the Project Location is located outside of all significant woodlands. Potential effects of the Project on significant woodlands within 120 m of the Project Location are as follows:

Turbines (measured at the turbine blade tip) and their associated laydown area are located within 120 m of woodland features wo36, wo43, wo55, wo66, wo67, wo69, wo74, wo85, wo88, wo89, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo105, wo107, wo108, wo111, wo112, wo113, wo124, wo138, wo139, wo142, wo150, wo151, wo153, wo154, wo177, wo178, wo180, wo183, wo184, wo190, wo194 and wo196. Potential impacts of turbines on woodlands within 120 m include temporary dust generation, sedimentation and erosion during construction/decommissioning, and the potential for spills and contamination to the woodland. The closest turbine blade tip is 2.7m from the woodland edge.

Laydown areas for turbines are located within 120m of woodland features wo36, wo44, wo55, wo66, wo67, wo69, wo74, wo80, wo85, wo88, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo104, wo106, wo107, wo108, wo111, wo112, wo113, wo114, wo119, wo124, wo138, wo139, wo142, wo150, wo151, wo153, wo154, wo177, wo178, wo180, wo183, wo184, wo190, wo191, wo194 and wo196. Potential impacts of turbine laydown areas on woodlands within 120 m include temporary dust generation, sedimentation and erosion, accidental intrusion and vegetation removal, the potential for spills and contamination to the woodland, and temporary disturbance to habitat from construction noise.

Overhead collector lines are located within 120m of woodland features wo45, wo46, wo47, wo50, wo58, wo63, wo68, wo82, wo83, wo121, wo127, wo132, wo135, wo140, wo145, wo156, wo160, wo172, wo173, wo179,wo195, wo208, wo209, wo212, wo213, wo215, wo216, wo217, wo218,wo220, wo221 and wo223. Overhead transmission lines are located within 120m of

features wo5, wo14, wo22, wo24, wo25, wo47, wo49, wo88, wo89, wo118, wo141, wo144, wo145, wo198, wo199 and wo206.

For some of these features, construction and decommissioning activities would occur on the opposite side of the road and no direct impact to the woodland function or form or habitat is expected. For the remaining features where construction/decommissioning would take place on the same side of the road, activities would occur within the municipal road allowance adjacent to the woodland feature. If overhead/underground lines are required adjacent to these features, the collector system would be installed within the municipal road allowance in areas that have been previously cleared. Construction and decommissioning activities include installing or removing collector lines.

For installation of new overhead lines, poles would be set to a depth of approximately 2 to 3 m and power lines strung between them. Overall, construction and decommissioning activities are to be low impact and very short term in duration. The trenches (or poles) would be installed at a shallow depth and the total area impacted would be small, therefore there are no anticipated changes to the surface water or groundwater contributions to the features. Construction and decommissioning activities adjacent to each feature are expected to be short term in duration (completed within a day) and small in scale, and so minimal dust would be generated.

Underground collector lines are located within 120m of woodland features wo35, wo36, wo43, wo44, wo52, wo55, wo61, wo67, wo69, wop74, wo85, wo86, wo88, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo105, wo107, wo108, wo111, wo112, wo113, wo114, wo115, wo119, wo124, wo129, wo136, wo138, wo139, wo142, wo150, 151, wo153, wo154, wo163, wo170, wo176, wo177, wo178, wo180, wo183, wo184, wo185, wo190, wo191, wo194, wo196. Underground collector lines are proposed within 1m of 12 of these woodland features (wo43, wo66, wo69, wo103, wo108, wo113, wo119, wo153, wo190, wo191 and wo194). Potential impacts of underground collector lines during construction and decommissioning on adjacent woodlands include temporary dust generation, sedimentation and erosion, the potential for spills and contamination to the woodland, temporary disturbance to habitat from construction noise, root zone disturbance, and changes to surface water flow from existing conditions.

Of note, the specific sections of collector and transmission lines to be installed above ground and underground may change during the detailed design stage. For the purposes of the NHA, any impacts and mitigation associated with specific significant woodlands has been assessed assuming either design (above or below ground) would be applicable.

The constructible areas for access roads are within 120m of woodland features wo35, wo36, wo43, wo44, wo51, wo52, wo55, wo61, wo66, wo67, wo69, wo74, wo80, wo85, wo86, wo88, wo91, wo92, wo97, wo98, wo99, wo100, wo102, wo103, wo104, wo105, wo107, wo108, wo111, wo112, wo113, wo115, wo124, wo129, wo136, wo138, wo139, wo142, wo149, wo150, wo151, wo153, wo154, wo163, wo170, wo176, wo177, wo178, wo180, wo183, wo184, wo185, wo190, wo191, wo194 and wo196. Potential impacts of access roads on woodlands within 120 m include temporary dust generation, sedimentation and erosion, accidental intrusion and

vegetation removal, the potential for spills and contamination to the woodland, and temporary disturbance to habitat from construction noise

The constructible area for access roads and underground collector lines has been sited away from woodlands. Given access roads would be narrow, relatively flat, unpaved roads that will receive relatively little regular traffic during the operation of the Project, they are not anticipated to cause significant root zone disturbance or changes to surface water flow from existing conditions. Underground collector lines are not anticipated to cause any significant root damage, as proposed works will be situated outside of the woodland edge drip line.

Indirect impacts resulting from construction and decommissioning activities, such as dust generation, sedimentation and erosion are expected to be short term, temporary in duration and mitigated for through the use of standard site control measures. During operation there is the potential for spills and contamination to the woodland.

Mitigation

Mitigation measures specific to significant woodlands are outlined in **Table 6.1, Appendix B**.

For all significant woodlands where tree trimming is required (i.e. due to accidental damage caused by construction activities), the following mitigation measures will be implemented:

- No development is permitted within the woodland boundary.
- Clearly delineate work area using erosion fencing to avoid accidental damage to trees
- The erosion fencing should be placed as far away as possible from the significant woodland and be placed no closer to the significant woodland than the drip-line.
- Erosion and sediment control structures should be monitored regularly to ensure that they are fully functional especially before and after major rainfall events. Should erosion and sediment control measures not be functional, they should be immediately repaired.
- Instruct workers on the importance of avoiding entrance to the demarcated area.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur well away from the woodland. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- All maintenance activities, vehicle refueling or washing, as well as the storage of chemical and construction equipment will be located more than 30m from significant woodlands.

- Tree pruning will be minimized to the greatest extent possible and any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.
- Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, MNR will be consulted on the appropriate action(s) to be taken.
- To the extent practical, pruning will be avoided during leaf fall, typically between September to November;
- Construction activities within 30m of significant woodlands should occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife.
- As appropriate and prior to construction the limits of tree pruning will be marked in the field. The Construction Contractor would ensure that no construction disturbance occurs beyond the marked limits;
- To the extent practical, tree pruning will be completed prior to or after the breeding season for migratory birds (May 1 to July 31). Should pruning be required during the breeding bird season, prior to construction, surveys will be undertaken to identify the presence/absence of nesting birds by a qualified biologist. If a nest is located, a designated buffer will be marked off within which no construction activity will be allowed while the nest is active. The radius of the buffer width ranges 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;
- One year post-pruning a certified arborist would undertake an evaluation of the health of the pruned trees.
- Mitigation measures for directional drill as per Section 6.3.1.4

Net Effects

Significant woodlands adjacent to existing municipal roads currently experience disturbance from ongoing use of the road and associated maintenance. The brief and low impact nature of construction and decommissioning activities required within the municipal road allowance required for the Project and the low impact during Project operation would result in minimal negative impacts to these woodlands. Once construction is complete, the only impact associated with the operation of the collector and transmission lines would be tree trimming associated with on-going maintenance activities.

Significant woodlands adjacent to agricultural fields currently experience disturbance from activities such as plowing, planting, spraying and other disturbances that affect the woodland edge communities. These communities are accustomed to some level of disturbance. While some impacts may occur temporarily during construction, appropriate mitigation measures will be implemented to minimize such impacts.

Based on the potential effects on significant woodlands from wind turbines and access roads and the effectiveness of proposed mitigation measures, there would be minimal effects from the Project on these 104 woodlands.

6.6 SIGNIFICANT WILDLIFE HABITAT

6.6.1 Migratory Landbird Stopover Areas

There are 4 features within 120 m of the Project Location that are considered significant wildlife habitat as migratory landbird stopover areas. These include features mlsa1, mlsa2, mlsa3 and mlsa4. Project components located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
Mlsa1	None	221.91 ha	None	None	• T14 (36.9m to blade tip and 72.9m to turbine base) • T16 (15m to blade tip and 87m to turbine base) • T21 (19m to blade tip and 55m to turbine base) • T22 (18.4m to blade tip and 54.4m to turbine base) • T44 (40m to blade tip and 76m to turbine base) • T45 (3.9m to blade tip and 39.9m to turbine base) • T47 (64.9m to blade tip and 100.9m to turbine base) • T61 (16m to blade tip and 52m to turbine base) • Laydown Area (7.3m, 55.1m, 20.2m, 8.9m, 18.0m, 12.6m, 7.3m, 11.7m) • Access road (0m, 70.8m, 113.4m, 51.2m, 95.0m, 24.8m, 2.0m, 2.1m, 66.9m, 64.5m) • Collector Line (0m)
Mlsa2	None	116.99 ha	None	None	• Access Road (0.1m, 110.7m) • Collector Line (7.8m, 5.9m, 10.3m, 14.1m, 14.3m, 17.1m, 17.4m) • Laydown Area (2.6m, 11.6m, 81.2m)

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
					• T62 (74.5m to turbine base, 68.5m to blade tip) • T63 (47.4m to turbine base, 11.4m to blade tip) • Fibre Optic (7.8m, 10.3m, 14.1m, 17.1m)
Mlsa3	None	46.93 ha	None	None	• Access Road (42.6m) • Collector Line (52.6m) • Laydown Area (5.6m) • T24 (40.1m to turbine base, 4.1m to blade tip) • Fibre Optic Line (52.6m)
Mlsa4	None	25.57 ha	None	None	• Access Road (17.3m) • Collector Line (0.1m, 101.5m, 9.9m, 8.6m) • Laydown Area (17.2m) • T20 (89.0m to turbine base, 53.0m to blade tip) • Fibre Optic Line (0.1m, 8.6m, 101.5m, 9.9m)

*the distance to turbine base as provided is measured to the outer extent of the turbine foundation; a 12.5 m diameter extending from the turbine tower.

Potential Effects

Potential effects to migratory landbirds may occur indirectly from disturbance or directly through mortality. Indirect effects such as destruction, fragmentation, and disturbance of habitat as a result of wind energy projects have been identified as larger threats than direct mortality (Kingsley and Whittam, 2007). The following is a summary of these potential effects:

Direct Effects

During operation, direct mortality from collision with wind turbines is a potential effect. Each turbine that is installed has an impact by directly adding to mortality rates (Masden et al., 2010). From a conservation perspective, the critical issue is whether or not this source of mortality is sufficiently great to impact populations.

Mortalities of migrating landbirds from the wind project are expected to be distributed among a variety of species, most of which were found to be abundant as documented in the NHA/EIS for

the Project. As a group, songbirds are considered the most abundant group in the terrestrial ecosystem (NAS, 2007). Migratory passerines that were found to be the most common within the Niagara Region Wind Farm Location were: Common Grackle, Blue Jay, American Robin, White-throated Sparrow, Black-capped Chickadee, Song Sparrow, American Crow and Field Sparrow. These species are among the most common and widespread species in Ontario and are considered to be able to respond relatively quickly to population fluctuations (Drewitt and Langston, 2008). Existing studies indicate that the number of individuals that collide with wind turbines has been low relative to the large number of individuals that have been recorded moving through landscapes, and as compared to regional or provincial populations.

Based on known bird mortality rates from operational wind projects, MNR has set a threshold for bird mortality of 14 birds/turbine/year(MNR, 2011c). If mortality levels are maintained below the threshold, the Project would not be considered to have significant impacts to populations of migratory landbirds. An Environmental Effects Monitoring Plan has been developed for the Niagara Region Wind Farm. In the event that the threshold for bird mortality is exceeded, a contingency and adaptive management plan will be implemented to reduce bird mortality and ensure that the mortality rates are maintained below the threshold level.

Indirect Effects

Wind facilities are considered to have a relatively small operational footprint and consequently the direct loss of habitat is considered low (National Research Council, 2007). However, indirect effects as a result of habitat loss can potentially include shifts in species abundance, avoidance, and behavioural disruption.

Potential 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.

Information regarding the effects on migrating passerines of disturbance and habitat fragmentation due to wind turbines is limited. Birds may move around the wind farm, or gain additional altitude and fly well above turbine height (SNH, 2009.This avoidance response may eventually contribute to an impact (i.e. reduced population size as a result of lower breeding success due to the expenditure of energy during migration than the bird would have otherwise) (Masden et al., 2010). 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 on the fitness of 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).

Mitigation Measures

Research indicates that migrants may concentrate within riparian areas located within 400 m from shorelines (Bonter et al., 2008; Ewert et al., 2006) and information estimating bird mortality could be significantly reduced if turbines were not placed in the "nearshore" area (i.e., within 250 m) (James, 2008). A such, the turbines for this Project have been located a minimum of 970m from Lake Erie.

In addition, the following mitigation measures will be implemented:

- Turbine lighting must conform to Transport Canada standards. Lights with the shortest allowable flash durations and the longest allowable pause between flashes are preferred.
- To the extent possible, no steady burning lights/floodlights will be used at the facility.
- Only scattered trees and grassland habitat will be removed for the purpose of this project. Accidental intrusion into the habitat could cause vegetation damage. Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1
- Minimize disturbance during construction, especially during sensitive during the sensitive migratory periods (April/May and Sept/Oct).
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3.
- A Replanting and Restoration Plan will be created for the Project as described in Section 6.5.
- A Vegetation Monitoring Plan will be developed for the project to monitor the success of the Replanting Plan and the Invasive Species Management Plan as described in Section 6.5.
- Post construction mortality monitoring for birds will be conducted twice weekly (3-4 day intervals) mortality monitoring at twenty-three turbines (30%)from May 1 to October 31, and weekly monitoring for raptors during November, for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents (as detailed in the Environmental Effects Monitoring Plan, Niagara Region WindFarm Design and Operations Report).

- Post-construction monitoring for disturbance will be conducted in all significant migratory landbird stopover areas for a period of three years, using the same protocols as the pre-construction surveys (Spring and Fall). Results of these surveys will be submitted to MNR on an annual basis.
- Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation.
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed
- The Environmental Effects Monitoring Plan also identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met.

Pre-Construction Monitoring

Fall migratory landbird surveys will be conducted to determine the use of mlsa3 and mlsa4 as migratory stopover areas. Transects used during spring migratory surveys will be used for the fall surveys. Surveys begin half an hour after sunrise and continue for approximately two hours. All species and their total numbers observed along each transect will be recorded, as well as the habitat type(s) being surveyed. A handheld GPS unit will be used to georeference transect start and end point locations.

Protocols are to be consistent with the guidance document Birds and Bird Habitats: Guidelines for Wind Power Projects (OMNR, 2011). Surveys will be conducted in the Fall from early September to mid-October with a total of 9 visits to each transect.

Additional information that will be recorded on the appropriate data forms include:

- Weather conditions (temperature, wind speed (on a Beaufort scale), % cloud cover, and presence of any precipitation should be recorded);
- Date and time of day;
- GPS coordinates of the point location; and
- Name of the observer doing field work

6.6.2 Raptor Wintering Areas

There are 4 features within 120 m of the Project Location that are considered significant wildlife habitat for wintering raptors. These include features wr1, wr2, wr3, and wr4. Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**. Project components located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wr1	None	10.0	None	None	• Access Road (95.8m) • Collector Line (7.9m, 7.8m, 9.4m, 9.5m, 12.2m) • Fibre Optic Line (0m)
wr2	None	22.59	None	None	• Access Road (0m) • Collector Line (0m, 10.7m, 12.2m, 17.4m, 113.0m, 114.3m) • Laydown Area (3.2m) • Fibre Optic Cable (0m, 10.7m)
wr3	Access Road Collector Line	22.51ha	0.33ha	0.18ha	• None
wr4	None	40.36	None	None	• Access Road (0m, 22.9m) • Collector Line (0m, 14.3m, 6.9m, 8.7m, 3.7m, 5.3m, 4.8m, 5.2m, 11.7m, 50.3m, 6.2m, 9.0m, 96.1m) • Laydown Area (0m, 14.4m) • T58 (37.8 to turbine base and 1.8 to blade tip)

Potential Effects

The Project Location contains some grassland habitat, predominantly hay and pasture, which provides significant habitat for wintering raptors, including one Species of conservation concern, the Short-eared Owl. The raptor wintering areas mostly consist of hay and pasture fields, with woodlands that provide roosting opportunities. Woodlands adjacent to grassland habitat consist of deciduous trees, which may be used by roosting American Kestrel and Red-tailed Hawks. The grassland habitat provides hunting opportunities for Short-eared Owl. Annual numbers of these species are dependent on the number of meadow voles, the population of which fluctuates widely on a four to five year cycle (Weir, 1989).

Potential effects to wintering raptors may occur indirectly from disturbance or directly through mortality. Fragmentation and disturbance of habitat as a result of wind energy projects were identified as a potentially larger threat to wintering raptors than direct mortality (Kingsley and Whittam 2007). Also, noise levels during operation might impact hunting raptors, in particular owl species which primarily hunt by sound.

Direct Impacts

All project components are located outside of features wr1, wr2 and wr4. Access Roads are proposed adjacent to features wr1 and wr2 and an underground collector line adjacent to feature wr2. Project components are proposed within feature wr3that will result in direct loss of habitat, although this amount represents a relatively small amount of significant open country habitat in the Project Location. In total, 0.33 ha of grassland habitat will be temporarily removed and 0.18 ha of grassland habitat will be removed at the edge of the habitat for the life of the project; this respectively represents 0.30% and 0.16% of the total identified significant Raptor Wintering area habitat. As a result the habitat still meets MNR's minimum size criteria as per the 7E Ecoregion criterion schedule (>15ha open habitat and at least 5 ha of woodland habitat). No loss of woodland roost habitat will occur.

The removal and fragmentation of natural habitats, especially wetlands and woodlands, has been minimized by avoiding construction of the Project in or across any natural habitats. To minimize disturbance to wintering birds, vehicle movements within construction areas and access roads will be restricted to avoid the harassment of wildlife.

The disturbance due to installation of access roads, transmission lines, and footings will be localized as construction will be systematically phased over the Project area. Additionally, construction willbe curtailed during periods of high winds or very cold temperatures, when wintering birds may be more vulnerable to disturbance.

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 that run through the significant habitat (wr3) see **Figures 7.1 – 7.58, Appendix A**). If maintenance activities are required in these areas, mitigation measures used during construction should be implemented (**Table 6.1, Appendix B**)..

Due to the concentration of raptors during the winter, there is some risk of potential negative effects, including mortality. Raptors appear to be more vulnerable to collision than other species groups (National Academy of Sciences 2007). 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.

Pre-construction baseline winter raptor surveys were conducted to establish areas of raptor use and general flight heights in the study area. Post-construction winter raptor use surveys, specifically transect surveys within significant habitats will be conducted for a period of three yearsto assess potential displacement or disturbance effects (i.e., distribution and abundance) to these species compared to pre-construction conditions. When the wind plant is operational, mortality studies will be considered to determine if the turbines result in collisions. Any such post-construction monitoring studies will be developed in consultation with MNR and have been outlined in the EEMP.

Proposed Mitigation

The following mitigation measures will be implemented:

- Turbines have been sited to avoid significant wildlife habitat for wintering raptors
- Construction activities will be timed to avoid construction in and within 120m of the habitat features during the winter months (December to February).Access roads and turbines have been sited along or close to the edges of agricultural fields to minimize disturbance on habitats.
- Post construction mortality monitoring for raptors will be conducted monthly at all turbines from May 1 to October 31, and weekly monitoring for raptors from November 1 to April 30, for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents (Birds and Bird Habitat: Guidelines for Wind Power Projects, 2011).
- Post-construction monitoring for disturbance will be conducted in all significant raptor wintering areas (wr1, wr2, wr3 and wr4) for a period of three years, using the same protocols as the pre-construction surveys.
- Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation.
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed
- An Environmental Effects Monitoring Plan identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met.

6.6.3 Bat Maternity Colonies

There are 45features within 120 m of turbines that are considered potential significant wildlife habitat for bat maternity colonies (bmc1, bmc3, bmc6, bmc7-20, bmc23-39, bmc42-55). Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**. Project components located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
1	None	3.173	None	None	• T53(45.78m)
3	None	4.01	None	None	• T81(6.70m)
6	None	6.69	None	None	• T97(60.58m)
7	None	2.782	None	None	• T97(51.71m)
8	None	2.804	None	None	• T98(3.62m)

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
9	None	4.404	None	None	• T98(32.74m)
10	None	2.455	None	None	• T93(55.03m)
11	None	2.059	None	None	• T93(14.58m)
12	None	0.141	None	None	• T94(68.11m)
13	None	0.57	None	None	• T07(25.46m)
14	None	0.682	None	None	• T07(69.59m)
15	None	2.148	None	None	• T94(14.35m)
16	None	3.597	None	None	• T07(23.95m)
17	None	0.35	None	None	• T66 (98.52m)
18	None	0.13	None	None	• T85 (97.55m)
19	None	0.04	None	None	• T66 (15.84)
20	None	1.254	None	None	• T91(34.65m)
23	None	2.649	None	None	• T11(28.25m) • T41(62.28m)
24	None	5.323	None	None	• T05(28.67m)
25	None	0.566	None	None	• T12(91.80m)
26	None	1.176	None	None	• T12(12.86m)
27	None	0.45	None	None	• T12(66.80m)
28	None	0.48	None	None	• T96(72.27m)
29	None	0.207	None	None	• T63(86.79m)
30	None	0.105	None	None	• T96(84.25m)
31	None	22.4	None	None	• T63(11.52m)
32	None	20.106	None	None	• T62(38.50m) • T63(105.33m)
33	None	8.218	None	None	• T74(2.70m)
34	None	3.609	None	None	• T95(42.14m)
35	None	0.678	None	None	• T01(79.22m)
36	None	2.88	None	None	• T01(92.96m)
37	None	1.729	None	None	• T76(8.35m)
38	None	3.25	None	None	• T76(53.16m)
39	None	0.753	None	None	• T44(74.90m)
42	None	0.138	None	None	• T34 (113.46m)
43	None	0.698	None	None	• T02(95.77m)
44	None	0.469	None	None	• T02 (50.99m)
45	None	3.588	None	None	• T02 (75.62m)

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
46	None	0.007	None	None	• T58 (115.68m)
47	None	2.346	None	None	• T78 (21.29m)
48	None	0.918	None	None	• T29 (79.19m)
49	None	0.28	None	None	• T29 (104.23m)
50	None	1.007	None	None	• T59 (84.18m)
51	None	6.456	None	None	• T80 (6.79m)
52	None	0.441	None	None	• T80 (38.25m)
53	None	0.295	None	None	• T80 (19.95m)
54	None	0.907	None	None	• T79 (9.32m)
55	None	0.58	None	None	• T79 (43.69m)

Potential Effects

All project components are located outside of potential significant habitats for bat maternity colonies.

As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), due to the location of turbines within 120 m of potential candidate habitats for bat maternity colonies, the proponent must commit to undertaking studies to determine the actual use of the habitat prior to any construction activities occurring within 120 m of the habitats. Details of the surveys are outlined in Section 5.3.1.No surveys will be undertaken in bmc3, bmc12, bmc15, bmc19, bmc24, bmc36, bmc39, bmc45 and bmc46 due to access constraints. These features are being treated as significantfor the purposes of this reportand mortality monitoring will occur at turbines within 120m of these habitats.

Bats may be displaced from suitable habitat due to habitat loss or fragmentation during the construction of a project, human activity, or noise (e.g. construction activities, roads, turbines, etc.) (MNR 2011a). Provided the short-term and temporary nature of construction activity, negligible effects are anticipated.

Direct Impacts

Environment Canada et al. (2011) reported that bat casualties outnumbered birds at almost all wind farm sites in Canada (64% of all carcasses found) and Ontario (66% of all carcasses found) for post-construction monitoring studies conducted between 2006 and 2009. Bats may be injured or killed through collisions with moving turbine blades and barotrauma (internal haemorrhaging), caused by rapid air pressure reduction near moving turbine blades. Contributing factors include time of year, species, habitat or landscape features in the

area, and weather conditions, including wind speed, with the following key consideration prevalent in the literature:

- Essentially all studies of bats demonstrate that peak fatalities occur during late summer, early fall migrations (NWCC 2011; Environment Canada et al. 2011; MNR 2007).

- Bats tend to be most active during periods of low wind. Some studies indicate that bat collisions occur primarily on nights with low speed and typically increase immediately before or after passing storm fronts (NWCC 2011).

The section below provides a review of bat mortality rates at various wind farms in Ontario and North American as a benchmark for direct impacts to bats. Based on known bat mortality rates from operational wind projects, MNR has set a threshold for bat mortality (OMNR 2011a). If mortality levels are maintained below the threshold, the Project would not be considered to have significant impacts to bat populations. An Environmental Effects Monitoring Plan (included in the Project Design and Operations Report) describes a response and contingency plan that will be implemented if performance objectives cannot be met.

Indirect impacts to bats, such as avoidance of an area, habitat disruption, reduced population density, habitat abandonment, loss of refuge, habitat unsuitability and behavioural effects have not been demonstrated in North America (NWCC 2010).

Bat Mortality

In Ontario, most bat casualties were found in July, August and September (89% of bat carcasses) with peak numbers occurring in August (44%) (Environment Canada et al. 2011). The MNR (2007) indicated that over 90% of bat fatalities at wind plants occur between mid-July and the end of September.

Long-distance migratory bats (i.e. hoary bat, eastern red bat, silver-haired bat) typically comprise the majority of bat fatalities (MNR 2011a). Long-distance migratory tree bats comprised upto nearly 85% of fatalities identified in during post-construction surveys at the Wolf Island Wind Farm (Stantec 2012a).Similar rates of mortality and seasonal trends would be expected for the Niagara Region Wind Farm.

Proposed Mitigation

All Project components are sited outside natural features that may be considered significant for bat maternity colonies.

The mitigation strategy will include:

- Turbines have been sited to avoid significant wildlife habitat for bat maternity colonies.

- Only scattered trees and grassland habitat will be removed for the purpose of this project. Accidental intrusion into the habitat could cause vegetation damage. Mitigation measures for vegetation removal will be implemented as outlined in Section 6.3.1.1
- Post construction mortality monitoring for bats will be conducted twice weekly (3-4 day intervals) mortality monitoring of birds and bats at 30% (23 of 77) of the wind turbines from May 1 to October 3 for three (3) years. 1. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents.
- Post construction disturbance monitoring will be conducted in significant features within 120m of turbines. Exit Surveys should be conducted at each significant habitat in June (30 minutes before dusk until 60 minutes after dusk) for a period of three (3) years.
- Report the findings of all monitoring programs to MNR on upon completion of the post-construction monitoring work
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed
- Those turbines within 120 m of significant bat maternity colony features will be included in the sample of turbines to be selected for post-construction mortality monitoring surveys.
- Those turbines within 120 m of significant bat maternity colony features that could not be surveyed due to access issues will be included in the sample of turbines to be selected for post-construction monitoring surveys.
- Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation.
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed
- An Environmental Effects Monitoring Plan identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met.

Pre-Construction Monitoring

Bat maternity habitatpre-construction surveys will be undertaken in FOD communities within 120 of Turbines for which access is available (bmc1, bmc6, bmc8-12, bmc15, bmc20, bmc23, bmc25-31,bmc33-35, bmc37-39 bmc42, bmc46-55). No surveys will be undertaken in bmc3, bmc12, bmc15, bmc19, bmc24, bmc36, bmc39, bmc45 and bmc46 due to access constraints. These features will be assumed to be significant.

Candidate bat maternity habitat will be determined by determining the density of snags/cavity tree is in the woodland. This will done by using randomly selected plots, with a 12.6 m radius, as described in Bats and Bat Habitats (MNR 2011b), throughout the applicable habitat. A

minimum of 10 plots for woodlands 10 ha or less in size is required. An additional plot is required in larger woodlands for each hectare over 10 ha, up to a maximum of 35 plots.

These communities will be surveyed during leaf-off condition in Spring (March / April) to document ≥25cm dbh wildlife trees and identify candidate forests for maternity colony roosts.If snag/ cavity tree density is ≥10 snags per hectare of trees ≥25 cm dbh, then the site is a candidate for maternity colony roosts and EOS exit surveys are required.

All candidate forests for maternity colony roosts will be subject to evaluation of significance exit surveys in June (30 minutes before dusk until 60 minutes after dusk) to identify confirmed SWH. If the total Tree Cavity Density is ≥10 cavity trees/ha, then 10-30 candidate roost trees will be monitored once per candidate habitat.Evaluation methods will follow the “Guidelines for Wind Power Projects Potential Impacts to Bats and Bat Habitats”.

Additional information that will be recorded on the appropriate data forms include:

- Weather conditions (temperature, wind speed (on a Beaufort scale), % cloud cover, and presence of any precipitation should be recorded);
- Date and time of day;
- GPS coordinates of the point location; and
- Name of the observer doing field work

6.6.4 Turtle Overwintering Habitat

Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**. Project Components located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Components located within 120 m (approximate closest point in parenthesis)
twa1	Transmission and Collector lines proposed over the feature	None	None	None

Potential Effects

As development is proposed within twa1, Evaluation of Significance surveys must be undertaken to determine the actual use of the habitat by turtles prior to any construction activities occurring in the habitat.

Habitat use surveys will be conducted in the spring of 2013 to determine the use of twa1. Over-wintering areas will be searched for congregations (basking area) of turtles on warm, sunny days during the spring (April-May).

As an alternative to directional drill under the Welland River (twa1), the option to install the transmission and collector lines over this feature is being considered as part of this EIS. No poles are proposed within the feature therefore no loss of overwintering habitat is proposed. Potential impacts from construction activities outside of this feature is less of a concern than directional drill but may include erosion and sediment deposition. By avoiding the installation of poles within the river and given the temporary nature of the activity, the relatively short duration of activities, the location of the activities (within actively managed agricultural fields) and the erection of barrier fencing (i.e. silt fencing), the risk of impacts to the turtle overwintering feature is considered low.

Barrier fencing is proposed around all construction zones within 120 m of turtle overwintering habitat features to prevent turtles and other wildlife from interacting with the Project. Provided the fence is constructed to suitable specifications and maintained in good repair, direct impacts to turtles are very unlikely. Erosion control fencing is suitable for this purpose and also protects any aquatic features from sediment laden runoff.

Proposed Mitigation

The mitigation strategy will include:

- No development is permitted within the turtle overwintering habitat.
- Avoid Construction during sensitive periods when turtles are emerging from their overwintering habitat to nest (Apr/May) or re-entering hibernacula in the fall (late September early October)
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.3.1.
- All refueling activities will occur greater than 30m from the feature. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

Pre-Construction Monitoring

Habitat use surveys will be conducted in the spring to determine the use of twa1. Over-wintering areas will be searched for congregations (basking area) of turtles on warm, sunny days during the spring (April-May). This feature will be surveyed a minimum of 3 times: once early in the

season (e.g. early-April); once in mid-season (e.g. mid-april), and once later in the season (e.g. early may). For each survey, the surveyor will walk the boundary of the wetland where turtles are likely to be basking. Data, including species and numbers of individuals, will be recorded on Reptile Hibernacula Observation Forms. Additional information that will be recorded on the appropriate data forms include:

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

Pending completion of these studies, site specific mitigation is being proposed for candidate SWH for turtle wintering areas. If the pre-construction habitat use surveys conclude that the wintering areas do not constitute SWH, the site specific mitigation measures proposed will not be required and best management practices will be substituted

6.6.5 Snake Hibernaculum

There are 5features within 120 m of the Project Location that are significant wildlife habitat for snake hibernacula. These include Features sh2, sh3, sh4, sh6 and sh7. As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), impacts to snake hibernaculum need to be assessed for access roads within 120 m of features. All other snake hibernaculum features (sh5) within 120m of all other project components are considered as generalized significant habitat.

Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**. Access roads located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Access Roads located within 120 m (approximate closest point in parenthesis)
sh2	None	None	None	• Access Road (32.6m)
sh3	None	None	None	• Access Road (82.7m)
sh4	None	None	None	• Access Road (74.9m)
sh6	None	None	None	• Access Road (83.9m)
sh7	None	None	None	• Access Road (43.1m)

The Project Location is not sited within significant wildlife habitat for snake hibernacula. None of the features are within 120m of turbines however sh2 and sh4 are within 120m of the laydown areas of turbines. All features are located within 120m of collector lines and access roads. Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**.

Potential Effects

All components of the Project are sited outside of features sh2, sh3, sh4, sh6 and sh7. No loss of habitat is anticipated from the Project.

The Project Location (new access road) is located 32.6m from sh2, 74.9m from sh4, and 60.8m from sh6, respectively. No habitat loss or fragmentation would result from the construction of the new access road, all of which are proposed within active agricultural fields. Overall, construction activities will be low impact and very short term in duration.

As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), due to the location of access roads within 120 m of sh2, sh4, sh6 and sh7, the proponent must commit to undertaking studies to determine the actual use of the habitat prior to any construction activities occurring within 120 m of the habitats.

Given the size and characteristics of the forest communities containing sh2, sh3, sh4, sh6 and sh7 and the historic ranges of snake species in the Project Study Area, it is anticipated that the habitats could potentially support one of the indicator snake species identified in the Draft Significant Wildlife Habitat Ecoregion 7E Criterion Schedule, namely Eastern Gartersnake or the Species of Special Concern identified as potentially occurring within the Project Location, namely Milksnake and Eastern Ribbonsnake. As sh2, sh3, sh4, sh6 and sh7 are located in contiguous complexes of woodlands and wetlands, it is also assumed that access to the hibernacula is not restricted by the proposed turbine locations or access roads. The potential effects and proposed mitigations presented in the following sections reflect these reasonable assumptions.

During construction and decommissioning of the turbines, the access roads will experience some traffic, which will vary in intensity as the construction phase progresses. Snakes are at an increased risk from vehicle collisions, particularly on warm days in spring and fall when they are emerging from, entering hibernacula. Construction in the vicinity of snake hibernacula should avoid these sensitive periods to the extent reasonably possible.Barrier fencing is proposed around all construction zones within 120 m of snake hibernaculum features to prevent snakes and other wildlife from interacting with the Project. Provided the fence is constructed to suitable specifications and maintained in good repair, direct impacts to snakes are very unlikely. Given the temporary (i.e., one overwintering season or less) nature of the increased traffic activity, the restriction of construction and decommissioning activities primarily to daytime hours (when snakes can be seen) and the design/location of access roads (unpaved, gravel roads away from hibernacula) the risk of increased mortality during construction and decommissioning is

considered low. Some limited mortality is possible, however, the potential long-term effects to snake populations from this mortality is anticipated to be minimal. Aside from low mortality concerns during active use, the gravel roads are a relatively benign feature and do not pose any significant barrier to travel by Eastern Gartersnake or Milksnake and Eastern Ribbonsnake.

During operation of the Project, access roads would experience very little traffic on a daily basis and both mortality and barrier effects are expected to be negligible. Snakes are most susceptible in the daytime in spring and fall, as they travel to and from hibernacula areas. Maintenance vehicle traffic would primarily be restricted to daytime hours, when snakes can be seen and easily avoided.

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

Proposed Mitigation

All Project components are sited outside natural features that may be considered significant snake hibernacula.

The mitigation strategy will include:

- During operation, maintenance vehicle traffic will primarily be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate the 30 km/hr limit.
- No development is permitted within the snake hibernacula habitat.
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.3.1.
- Mitigation measures for dewatering will be implemented as outlined in Section 6.3.1.
- All refueling activities will occur greater than 30m from the feature. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

Pre-Construction Monitoring

Habitat use surveys will be conducted in the spring of 2013 to determine the use of sh2, sh3, sh4, sh6 and sh7. Hibernacula emergence/exit surveys will be conducted between the hours of 10:00 am and 3:00 pm on sunny warm days in spring (April/May) at the location of the candidate hibernacula. Each feature will be surveyed a minimum of 3 times: once early in the season (e.g., early April); once in mid-season (e.g., mid-April), and once later in the season (e.g., early May).

For each survey, the surveyor will observe for 20 minutes, recording all snake species and number of individuals observed entering or exiting the candidate hibernacula. The search pattern at each hibernaculum will include surveying all potential basking and sheltering habitat within the location (i.e., an area including a 30 m radius around the hibernaculum). The search route will be tracked using a GPS unit so the search pattern can be easily repeated. Data will be recorded on Reptile Hibernacula Observation Forms. Additional information that will be recorded on the appropriate data forms include:

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

Net Effects

The Project Location (turbine/laydown area and access road upgrades) is located within 120 m sh2, sh3, sh4 sh6 and sh7. It is anticipated that these features will not be adversely affected when utilizing the mitigation measures outlined above as agricultural activities currently extend to the edges of these features. Setbacks of greater than 30m to the potential significant hibernacula and mitigation measures presented in this EIS will ensure that there is no disruption of snake hibernaculum function through attenuation of disturbance effects from operational activities. There will be no net loss of snake hibernacula or functions.

6.6.6 Turtle Nesting Habitat

There are 21 features within 120m of the Project Location that are considered significant turtle nesting habitats. These include featuresth3, th5, th9, th10, th13, th19, th21, th26, th28, th29, th33, th38, th39, th40, th41, th42, th45, th46, th54, th62 and th69. As per the requirements of Appendix D of the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011a), impacts to turtle nesting habitat need to be assessed for access roads within 120 m of features.

Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**. Access roads located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Access Roads located within 120 m (approximate closest point in parenthesis)
th3	None	None	None	• Access Road (0.1m)
th5	None	None	None	• Access Road (69.58m)
th9	None	None	None	• Access Road (21.32m)
th10	None	None	None	• Access Road (88.09m)
th19	None	None	None	• Access Road (29.69m)
th21	None	None	None	• Access Road (0.1m)
th26	None	None	None	• Access Road (91.40m)
th28	None	None	None	• Access Road (73.05m)
th29	None	None	None	• Access Road (63.88m)
th38	None	None	None	• Access Road (20.69m)
th39	None	None	None	• Access Road (63.38m)
th40	None	None	None	• Access Road (65.70m)
th41	None	None	None	• Access Road (22.78m)
th42	None	None	None	• Access Road (0.1m)
th45	None	None	None	• Access Road (8.91m)
th46	None	None	None	• Access Road (88.65m)
th62	None	None	None	• Access Road (0.1m)
th69	None	None	None	• Access Road (0.1m)

Potential Effects

All components of the Project are sited outside of features th3, th5, th9, th10, , th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62 and th69. No loss of habitat is anticipated from the Project. Project Components are located within the 30m habitat buffer area to 10 of the potential significant habitat features (th3, th9, th19, th21, th38, th41, th42, th45, , th62, th69). Although proposed access roads are located within 30m of the features, the areas where the access roads are proposed are within active agricultural fields (corn, soy) and would not be considered part of the turtle nesting habitat.

No habitat loss or fragmentation would result from the construction of the new access road, all of which are proposed within active agricultural fields. Overall, construction activities will be low impact and very short term in duration.

As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), due to the location of access roads within 120 m of th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62 and

th69, the proponent must commit to undertaking studies to determine the actual use of the habitat prior to any construction activities occurring within 120 m of the habitats.

Habitat use surveys will be conducted prior to construction to determine the use of th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62 and th69. Candidate turtles nesting areas will be searched for nesting turtles on warm, sunny days in June as well as evidence of nesting, including scrapes or predated nests. Data will be recorded on Turtle Observation Forms.

During construction and decommissioning of the turbines, the access roads will experience some traffic, which will vary in intensity as the construction phase progresses. Turtles are at an increased risk from vehicle collisions, particularly on warm days in May and June as they move to nesting habitats. Construction in the vicinity of turtle nesting areas should avoid these sensitive periods to the extent reasonably possible. Given the temporary (i.e., one season or less) nature of the increased traffic activity, the restriction of construction and decommissioning activities primarily to daytime hours (when turtles can be seen) and the design/location of access roads (unpaved, gravel roads away from habitat) the risk of increased mortality during construction and decommissioning is considered low. Construction workers will be made aware of the potential occurrence of turtles in construction zones and on access roads, and will avoid interaction with any observed individuals to the extent possible.

Some limited mortality is possible, however, the potential long-term effects to turtle populations from this mortality is anticipated to be minimal. Aside from low mortality concerns during active use, the gravel roads are a relatively benign feature and do not pose any significant barrier to travel by turtle species.

Barrier fencing is proposed around all construction zones within 120 m of turtle nesting habitat features to prevent turtles and other wildlife from interacting with the Project. Provided the fence is constructed to suitable specifications and maintained in good repair, direct impacts to turtles are very unlikely. Erosion control fencing is suitable for this purpose and also protects any aquatic features from sediment laden runoff.

During operation of the Project, access roads would experience very little traffic on a daily basis and both mortality and barrier effects are expected to be negligible. Turtles are most susceptible in the daytime in May and June, as they travel from overwintering habitat to nesting habitat. Maintenance vehicle traffic would primarily be restricted to daytime hours, when turtles can be seen and easily avoided.

Disturbance to local turtle populations due to increased activity during construction and decommissioning would be temporary. Disturbance during operation of the turbines is anticipated to be minimal and temporary due to the periodic nature of maintenance and the fact that local populations would likely adapt to the new structures.

Proposed Mitigation

All Project components are sited outside natural features that may be considered significant turtle nesting habitat.

The mitigation strategy will include:

- During operation, maintenance vehicle traffic will primarily be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate the 30 km/hr limit.
- No development is permitted within the turtle nesting habitat.
- Construction workers will be made aware of the potential occurrence of turtles in construction zones and on access roads, and will avoid interaction with any observed individuals to the extent possible.
- Should turtles be found within the construction area, the use of standard care protocols for the removal of species will be used with instructions for the contractor to contact the appropriate ecological staff if a rare species specimen has been identified within the construction area.
- Should a turtle nest be encountered during construction, a buffer will be established and the nest will be protected from construction activities (such as with a wire cage) and monitored until the nest is no longer active.
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.3.1.
- Mitigation measures for dewatering will be implemented as outlined in Section 6.3.1.
- All refueling activities will occur greater than 30m from the feature. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.
- Post-construction monitoring for disturbance will be conducted for 1 year within significant turtle nesting features within 30m of proposed access roads. These will be conducted using the same protocols as the pre-construction surveys.
- Report the findings of all monitoring programs to MNR on upon completion of the post-construction monitoring work

- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed

Pre-Construction Monitoring

Prior to conducting evaluation of significance surveys, additional site investigation work will be conducted to determine if current land use within candidate habitats meet the habitat requirements as outlined in the Ecoregion criterion schedule (exposed sand and gravel deposits). If habitat is than EOS surveys need to be completed as follows.

Habitat use surveys will be conducted in the spring of 2013 to determine the use ofth3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, and th69. Candidate habitats will be surveyed on three separate dates during the breeding season (June to July) to make direct observations of turtle nesting and/or nesting evidence (e.g. hatched eggs and/or nests that have been dug up by predators).

Walking surveys will occur to systematically inspect all areas of exposed mineral (sand or gravel) substrates, spending a minimum of 15 minutes for every 100m^2 of candidate nesting substrate.

Surveyors will map and photo-document areas of exposed substrates, and photo-document any observed nesting evidence.

Additional information that will be recorded on the appropriate data forms include:

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

Net Effects

The Project Location (access road upgrades) is located within 120 m of th3, th5, th9, th10, th13, th19, th21, th26, th28, th29, th33, th38, th39, th40, th41, th42, th45, th46, th54, th62 and th69. It is anticipated that these features will not be adversely affected when utilizing the mitigation measures outlined above. Setbacks and mitigations presented in this EIS will ensure that there is no disruption of turtle nesting habitat through attenuation of disturbance effects from operational activities. There will be no net loss of turtle nesting habitat or functions.

6.6.7 Amphibian Woodland Breeding Habitat

As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), impacts to amphibian woodland habitat need to be assessed for access roads within 120 m of features. There have been 21 amphibian woodland habitat features identified within 120m of access roads (ah2, ah3, ah9, ah29, ah31, ah34, ah37, ah38, ah45, ah47, ah49, ah57, ah61, ah64, ah65, ah66, ah70, ah74, ah75, ah79, ah89). All other amphibian woodland habitat features (513) within 120m of all other project components are considered as generalized significant habitat.

Underground collector lines are proposed to be directionally drilled under 1 amphibian woodland breeding habitat feature (ah67).

Significant habitats for amphibian wetland breeding within 120 m of the Project Location are shown on **Figures 7.1 – 7.58 (Appendix A)** and indicated in **Table 5.9 (Appendix B).**

Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**.

Access Roads located in and within 120 m of each feature are detailed below:

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Access Roads located within 120 m (approximate closest point in parenthesis)
ah2	None	25.67	None	None	• Access Road (0.1m)
ah3	None	2.15	None	None	• Access Road (58.9m)
ah9	None	95.95	None	None	• Access Road (0.1m)
ah29	None	78.22	None	None	• Access Road (0.1m)
ah31	None	27.34	None	None	• Access Road (0.1m)
ah34	None	0.29	None	None	• Access Road (45.9m)
ah37	None	24.98	None	None	• Access Road (2.5m)
ah38	None	21.96	None	None	• Access Road (11.4m)
ah45	None	122.89	None	None	• Access Road (46.3m)
ah47	None	32.90	None	None	• Access Road (36.4m)
ah49	None	20.11	None	None	• Access Road (0.1m)
ah57	None	116.54	None	None	• Access Road (0.1m)
ah61	None	291.42	None	None	• Access Road (0.1m)
ah64	None	200.88	None	None	• Access Road (42m)
ah65	None	0.99	None	None	• Access Road (50.4m)
ah66	None	7.80	None	None	• Access Road (58.5m)
ah70	None	16.53	None	None	• Access Road (99.1m)
ah74	None	0.57	None	None	• Access Road (63.9m)

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Access Roads located within 120 m (approximate closest point in parenthesis)
ah75	None	4.28	None	None	• Access Road (62.4m)
ah79	None	9.40	None	None	• Access Road (67.1m)
ah89	None	0.97	None	None	• Access Road (0.1m)

Potential Effects

All components of the Project are sited outside these features. No loss of habitat or alteration of groundwater or surface water flow is anticipated from the Project. Dewatering required for the construction of the project components is anticipated to be very minor (<50,000l/day) and will not have an impact on groundwater flow to wetland habitat features.

The constructible area for Access Roads is proposed within 120m of 21 amphibian breeding habitats. The constructible area for the access roads is located adjacent to featuresah2, ah9, ah29, ah31, ah49, ah57, ah61 and ah89 and within 3m of ah37, 11.4m of ah38 and >36m of ah3, ah34, ah45, ah47, ah64, ah65, ah66, ah70, ah 74, ah75 and ah79.

The constructible area for the T9 turbine laydown area is located 40.2 m from Feature 20, and the constructible area for the access road is located 102.0 m from the feature. No habitat loss or fragmentation would result from the construction of any Project components.

During construction and decommissioning of the turbines, the access roads would experience some traffic, which would vary in intensity as the construction phase progresses. Amphibians are at an increased risk from vehicle collisions in spring, particularly on cool rainy nights as they move towards warmer road surface.

Given the temporary (i.e., one breeding season or less) nature of the increased construction traffic, the restriction of construction and decommissioning activities primarily to daytime hours and the design of access roads (unpaved, gravel roads) the risk of increased mortality during construction and decommissioning is considered low. Some limited mortality is possible, however, the potential long-term effects to wildlife populations from this mortality and from barrier effects is anticipated to be minimal.

Individual reproductive success has been directly related to calling effort in frogs (Sun and Narins, 2004). Therefore, noise is a concern during construction/decommissioning and operation 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). However, construction

activities will be restricted to daytime hours when amphibian calling is less active, which limits the potential impact of construction noise on amphibian breeding.

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

During operation of the Project, access roads would experience very little traffic on a daily basis and both mortality and barrier effects are expected to be negligible. Amphibians are most susceptible in spring, particularly cool spring nights. Maintenance vehicle traffic would be restricted to daytime hours. On occasion, maintenance work may be required outside of the daytime period, however, such occasions would be infrequent.

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

Proposed Mitigation

All Project components are sited outside natural features that may be considered significant amphibian woodland breeding areas.

The mitigation strategy will include:

- During operation, maintenance vehicle traffic will primarily be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate 30 km/hr limit.
- No development is permitted within the amphibian breeding habitat boundary.
- Silt barriers (e.g., fencing) will be erected along the edge of the feature. Erosion and sediment fencing will be maintained and monitored, especially after a rain event and until vegetation has become established.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur well away from the feature. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.

- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.
- Water levels within significant amphibian habitat will be monitored during active dewatering to ensure there are no decreases or temporary loss of habitat. If a decrease in water levels is noticed, dewatering activities will cease until levels have stabilized. General mitigation measures for dewatering as outlined in Section 6.3.1.3
- Post-construction monitoring for disturbance will be conducted for 1 year in amphibian features within 30m of access roads (ah2, ah9, ah29, ah31, ah37, ah38, ah49, ah57, ah61, ah89). These will be conducted using the same protocols as the pre-construction surveys.
- Report the findings of all monitoring programs to MNR upon completion of post-construction monitoring
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed

Net Effects

Considering the temporary nature of construction effects, the distance between the features and the Project components, and the periodic nature of maintenance activities, it is likely that resident amphibians would adapt to the Project quickly. No significant net negative effects are anticipated to amphibian woodland breeding populations and their habitats.

6.6.8 Amphibian Wetland Breeding Habitat

There are 5 features within 120 m of the Project Location that are considered significant amphibian wetland breeding habitats. These include Features ah25, ah32, ah35, ah55 and ah83.As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), impacts to amphibian wetland breeding habitat need to be assessed for access roads within 120 m of features. Underground collector lines are proposed to be directionally drilled under 1 amphibian wetland breeding habitat feature (ah35).

Significant habitats for amphibian wetland breeding within 120 m of the Project Location are shown on **Figures 7.1 – 7.58 (Appendix A)** and indicated in **Table 5.9, Appendix B.**

Access roads found in and within 120 m of each amphibian wetland feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Access Roads located within 120 m (approximate closest point in parenthesis)
ah25	None	0.67	None	None	• Access Road (0.1m)
ah32	None	0.37	None	None	• Access Road (46.8m)
ah35	None	0.27	None	None	• Access Road (0.1m)
ah55	None	0.38	None	None	• Access Road (92.7m)
ah83	None	0.11	None	None	• Access Road (16.6m)

Potential Effects

All components of the Project are sited outside these features. No loss of habitat or alteration of groundwater or surface water flow is anticipated from the Project. Dewatering required for the construction of the project components is anticipated to be very minor (<50,000l/day) and will not have an impact on groundwater flow to wetland habitat features.

The constructible area for access roads is proposed within 120 m of amphibian wetland breeding habitat features, ah25, ah32, ah35, ah55 and ah83. The constructible area for the access road is located adjacent to features ah25 and ah35 and within 20m of ah83 and >46m from ah32 and ah55. No habitat loss or fragmentation would result from the construction of any Project components.

During construction and decommissioning of the turbines, the access roads would experience some traffic, which would vary in intensity as the construction phase progresses. Amphibians are at an increased risk from vehicle collisions in spring, particularly on cool rainy nights as they move towards warmer road surface.

Given the temporary (i.e., one breeding season or less) nature of the increased construction traffic, the restriction of construction and decommissioning activities primarily to daytime hours and the design of access roads (unpaved, gravel roads) the risk of increased mortality during construction and decommissioning is considered low. Some limited mortality is possible, however, the potential long-term effects to wildlife populations from this mortality and from barrier effects is anticipated to be minimal.

During operation of the Project, access roads would experience very little traffic on a daily basis and both mortality and barrier effects are expected to be negligible. Amphibians are most susceptible in spring, particularly cool spring nights. Maintenance vehicle traffic would be restricted to daytime hours. On occasion, maintenance work may be required outside of the daytime period, however, such occasions would be infrequent.

Disturbance to local amphibian populations due to increased activity during construction and decommissioning would be temporary and minimized through the implementation of proposed mitigation measures described below. Disturbance during operation of the turbines would also be minimal and temporary due to the periodic nature of maintenance activities, similar in nature to on-going agricultural activites (plowing, seeding, harvesting)and the fact that local populations would likely adapt to the new structures.

Proposed Mitigation

All Project components are sited outside natural features that may be considered significant amphibian wetland breeding areas.

The mitigation strategy will include:

- During operation, maintenance vehicle traffic will be restricted to daytime hours. Vehicle speeds will be restricted to 30 km/h or less.
- Speed limit signage will be erected to communicate 30 km/hr limit.
- No development is permitted within the amphibian breeding habitat boundary.
- Silt barriers (e.g., fencing) will be erected along the edge of wetland boundary. Erosion and sediment fencing will be maintained and monitored, especially after a rain event and until vegetation has become established.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur well away from the wetland. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.
- Water levels within significant amphibian habitat will be monitored during active dewatering to ensure there are no decreases or temporary loss of habitat. If a decrease in water levels is noticed, dewatering activities will cease until levels have stabilized. General mitigation measures for dewatering as outlined in Section 6.3.1.3
- Post-construction monitoring for disturbance will be conducted for 1 year in amphibian features within 30m of access roads (ah25, ah35, ah83). These will be conducted using the same protocols as the pre-construction surveys.
- Report the findings of all monitoring programs to MNR upon completion of post-construction monitoring
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed

Net Effects

Considering the temporary nature of construction effects, the distance between the features and the Project components, and the periodic nature of maintenance activities, it is likely that resident amphibians would adapt to the Project quickly. No significant net negative effects are anticipated to amphibian wetland breeding populations and their habitats.

6.6.9 Rare Vegetation Communities

As per the requirements of Appendix D of the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, 2011a), impacts to rare vegetation communities need to be assessed for access roads within 120 m of features. Project components have been identified within 120m of two (2) rare vegetation communities (rv2 and rv3). All other rare vegetation communities within 120m of all other project components (rv1, rv4, rv6 and rv7) are considered as generalized significant habitat.

Significant rare vegetation communities within 120 m of the Project Location are shown on **Figures 7.12 and 7.16 (Appendix A)** and indicated in **Table 4.8 (Appendix B).**

Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**.

Access Roads located in and within 120 m of each feature are detailed below:

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Access Roads located within 120 m (approximate closest point in parenthesis)
rv2	None	0.54	None	None	• Access Road (70.7m)
rv3	None	19.28	None	None	• Access Road (42.0m)

Potential Effects

The significant rare vegetation communities have been identified as part of significant woodland and wetland features. Rv2 is a Buttonbush Mineral Thicket Swamp found in wo80 and we167. Rv3 is a Fresh Moist Sugar Maple Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex found in wo69 and we124. Both communities are ranked S3. The impacts to these features is also considered as part of the assessment for significant woodlands and wetlands (see Section 6.3.3 and 6.3.4).

Both rare vegetation communities are adjacent to agricultural fields that are currently subject to activities such as plowing, potentially affecting the feature edge. The root zone has experienced some degree of compaction from current activities.

The constructible area for access roads has been sited away from rare vegetation communities. Given access roads would be narrow, relatively flat, unpaved roads that will receive relatively little regular traffic during the operation of the Project, they are not anticipated to cause significant root zone disturbance or changes to surface water flow from existing conditions.

Indirect impacts resulting from construction and decommissioning activities, such as dust generation, sedimentation, accidental intrusion and vegetation removal erosion are expected to be short term, temporary in duration and mitigated for through the use of standard site control measures. During operation there is the potential for spills and contamination to the woodland.

Mitigation

Mitigation measures specific to significant rare vegetation communities are outlined in **Table 6.1, Appendix B**.

Although it is not anticipated that tree trimming will be required, for all areas where tree trimming is required (i.e. as determined during the construction phase), the following mitigation measures will be implemented:

- No development is permitted within the rare vegetation communities and no rare vegetation will be removed.
- Inspectors will ensure construction vehicles and personnel stay within the construction envelope, thereby limiting the disturbance of natural vegetation.
- All refueling activities will occur well away from the woodland. In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.
- Tree pruning will be minimized to the greatest extent possible and any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.
- Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species. If re-planting is required, MNR will be consulted on the appropriate action(s) to be taken.
- To the extent practical, pruning will be avoided during leaf fall, typically between September to November;
- As appropriate and prior to construction the limits of tree pruning will be marked in the field. The Construction Contractor would ensure that no construction disturbance occurs beyond the marked limits;
- To the extent practical, tree pruning will be completed prior to or after the breeding season for migratory birds (May 1 to July 31). Should pruning be required during the breeding bird season, prior to construction, surveys will be undertaken to identify the presence/absence of nesting birds. If a nest is located, a designated buffer will be

marked off within which no construction activity will be allowed while the nest is active. The radius of the buffer width ranges 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;

- One year post-pruning a certified arborist would undertake an evaluation of the health of the pruned trees. Trees that die or are in poor health as a result of tree pruning will be replaced and the survivability of the trees monitored for a minimum of one year after planting.

Net Effects

Based on the potential effects on significant vegetation communities from access roads and the effectiveness of proposed mitigation measures, there would be minimal effects from the Project on these rare vegetation communities.

6.6.10 Species of Special Concern

Significant habitats for three species of Special Concern were identified within 120m of the Project Location.

6.6.10.1 Short-eared Owl

There are 3 features within 120 m of the Project Location that are significant wildlife habitat for Short-eared Owls. These include Features wr1, wr2 and wr4.

Potential impacts and mitigation measures are provided in **Table 6.1, Appendix B**. Project components located in and within 120 m of each feature are detailed below.

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
wr1	None	10.0	None	None	• Access Road (95.8m) • Collector Line (7.9m, 7.8m, 9.4m, 9.5m, 12.2m) • Fibre Optic Line (0m)
wr2	None	22.59	None	None	• Access Road (0m) • Collector Line (0m, 10.7m, 12.2m, 17.4m, 113.0m, 114.3m) • Laydown Area (3.2m) • Fibre Optic Cable (0m, 10.7m)
wr3	Access Road Collector Line	22.51ha	0.33ha	0.18ha	• None
wr4	None	40.36	None	None	• Access Road (0m, 22.9m)

Feature Number	Project Component(s) located in Natural Features	Feature Size (ha)	Total Amount of Habitat Removal Required Short Term (ha)	Total Amount of Habitat Removal Required Long Term (ha)	Project Component(s) located within 120 m (approximate closest point in parenthesis)
					• Collector Line (0m, 14.3m, 6.9m, 8.7m, 3.7m, 5.3m, 4.8m, 5.2m, 11.7m, 50.3m, 6.2m, 9.0m, 96.1m) • Laydown Area (0m, 14.4m) • T58 (37.8 to turbine base and 1.8 to blade tip)

The Project Location contains some grassland habitat, predominantly hay and pasture, which provides significant habitat for Short-eared Owls. The habitats consist of hay and pasture fields, with woodlands that provide roosting opportunities.

Potential effects to Short-eared Owls may occur indirectly from disturbance or directly through mortality. Fragmentation and disturbance of habitat as a result of wind energy projects were identified as a potentially larger threat to breeding birds than direct mortality (Kingsley and Whittam 2007). Also, noise levels during operation might impact hunting raptors, in particular owl species which primarily hunt by sound.

All project components are located outside of features wr1, wr2 and wr4. Access Roads are proposed adjacent to features wr1 and wr2 and an underground collector line adjacent to feature wr2. Project components are proposed within feature wr3that will result in direct loss of habitat, although this amount represents a relatively small amount of significant open country habitat in the Project Location. In total, 0.33 ha of grassland habitat will be temporarily removed and 0.18 ha of grassland habitat will be removed at the edge of the habitat for the life of the project; this respectively represents 0.30% and 0.16% of the total identified significant Short-eared Owl area habitat. As a result the habitat still meets MNR's minimum size criteria as per the 7E Ecoregion criterion schedule (>15ha open habitat and at least 5 ha of woodland habitat).

The disturbance due to installation of access roads, transmission lines, and footings will be localized as construction will be systematically phased over the Project area. Additionally, construction may be curtailed during periods of high winds or very cold temperatures, when wintering birds may be more vulnerable to disturbance.

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 that run through the significant habitat (wr5) see **Figures 7.1 – 7.58, Appendix A**). If maintenance activities are required in these areas, mitigation measures used during construction should be implemented (**Table 6.1, Appendix B**).

Pre-construction baseline Short-eared Owl surveys were conducted to establish areas of use and general flight heights in the study area. Post-construction winter raptor use surveys will be conducted to assess potential displacement or disturbance effects (i.e., distribution and abundance) to these species compared to pre-construction conditions. When the wind plant is operational, mortality studies will be considered to determine if the turbines result in collisions. Any such post-construction monitoring studies will be developed in consultation with MNR.

Proposed Mitigation

The following mitigation measures will be implemented:

- Turbines have been sited to avoid significant wildlife habitat for wintering Short-eared Owl, where feasible.
- Construction activities will be timed to avoid construction in and within 120m of the habitat features during the winter months (December to February).
- Access roads and turbines have been sited along or close to the edges of agricultural fields to avoid fragmentation and to minimize disturbance on habitats.
- Post construction mortality monitoring for birds will be conducted twice weekly (3-4 day intervals) at ten turbines from May 1 to October 31, and weekly monitoring for Owls from November 1 to April 30, for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents
- Post-construction monitoring for disturbance will be conducted in all significant Short-eared Owl habitats (wr1, wr2, wr3, wr4) for a period of three years, using the same protocols as the pre-construction surveys.
- An Environmental Effects Monitoring Plan identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met.
- Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation.
- If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed

6.6.10.2 Snapping Turtle

The impacts and mitigation measures for this species is considered as part of Turtle Nesting habitat in Section 6.6.5

6.6.10.3 Milksnake and Eastern Ribbonsnake

The impacts and mitigation measures for these species is considered as part of Snake Hibernaculum in Section 6.6.4.

6.6.10.4 Small-footed Bat, and Eastern Pipistrelle

The impacts and mitigation measures for this species is considered as part of Bat Maternity Colony habitat in Section 6.6.4

6.7 ANSI'S

6.7.1 Life Science ANSI

No project component is proposed within the St. Ann's Slough Forest Life Science ANSI. The Project layout in relation to the St. Ann's Slough Forest Life Science ANSI boundary is shown on Figures 7.13 and 7.14 **(Appendix A)**.

Project components sited in the ANSI and the 120 m Zone of Investigation are detailed below:

Feature	Project Component(s) located in Natural Features	Feature Size (ha)	Temporary Land Use footprint (>1 year)	Long-term Land Use footprint	Project Component(s) located within 120 m (distance at closest point)
St. Ann's Slough Forest Provincially Significant Life Science ANSI	• None	220.19	None	None	• Access Road (54.8m, 69.3m) • Collector Line (21.1m, 64.7m, 76.2m, 8.5m, 9.1m) • Laydown Area (6.5m, 80.9m) • T27 52.2m to turbine base (16.2m to blade tip)

Potential Effects

Turbines are sited more than 50 m from the ANSI boundary. The installation of turbine foundations is located outside of the Life Science boundary and would not result in the loss of form or function of the Life Science ANSI. Effects and mitigation specific to the types of significant natural features associated with this ANSI are discussed in other relevant sections of Section 6.3.

6.7.2 Earth Science ANSI

The portion of the Earth Science ANSI that the Project Location occurs within is broadly described as a "channel of bedrock" (Gorrell, 1991). The Project layout in relation to the Winger Earth Science ANSI boundary is shown on Figures 7.4 and 7.5 (Appendix A).

Project components sited in the ANSI and the 50 m Zone of Investigation are detailed below:

Feature	Project Component(s) located in Natural Features	Feature Size (ha)	Temporary Land Use footprint (>1 year)	Long-term Land Use footprint	Project Component(s) located within 50 m (distance at closest point)
Winger Earth Science ANSI	• Access Road • Collector Line • Laydown Area • T89	48.483	3.586	2.429	• Collector Line (98.9m, 116.3m) • Transmission Line (103m)

Potential Effects

Potential impacts to the Earth Science ANSI from construction of the turbine, access roads and collector line could include erosion or loss of part of the feature (NHRM, 2010). Alteration or destruction of landforms can also occur where grading activities are undertaken.

This ANSI has been identified as a sand dune formation from a glacial lake. Actively managed agricultural lands are currently located within the ANSI, and it is currently subject to impacts associated with these activities. There are no visual sand dunes on the property. Geotechnical investigations will be undertaken on the property prior to construction.

Access roads will be gravel roads. They will be approximately 6 m wide (40 m at a turning radius) with a 14 m wide staging area (20 m total). Staging areas will be temporary and will be restored to pre-existing conditions at the end of the construction phase. No blasting is anticipated for the excavation of the access roads.

The area required for installation of the access roads, turbine and collector lines comprises a small area within the ANSI (2.43 ha of the 48.48 ha feature; approximately 5% of the ANSI's land mass). No reduced stability or integrity of the landform is expected as a result of the construction and operation of small stretches of narrow gravel roads. The topography of the property is flat with minimal grading required for the installation of the access road and turbine. There will be no significant grading associated with construction activities and all project components proposed within the Earth Science ANSI will be constructed at grade. The longitudinal sand dune formations intended to be represented by this ANSI are not present within 120 m of the project components. As such, the Project is not expected to result in a loss of the feature or function of the earth science ANSI.

Proposed Mitigation

The following mitigation measures will be implemented:

- No significant grading, cutting or filling will occur to maintain the existing topography within the boundaries of the Earth Science ANSI;

- Any material excavated during the construction of the turbine or removed to construct the access roads will be disposed of off-site;
- Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1;
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2;
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3.; and
- Where possible, and as appropriate, access roads occurring within the ANSI will be constructed at or near existing grade.

Net effects

The Earth Science ANSI has been designated for its geological importance, and not its ecological importance. As such, the predominant aspect of the feature is associated with its subsurface composition and land area. Works for the Project that are proposed in the ANSI are spatially small and shallow works that would not impact the Earth Science ANSI feature or its function. There would not be a loss of provincially significant earth science values as a result of the Project.

6.8 GENERALIZED WILDLIFE HABITAT

A number of wildlife habitat types have been identified that may be present within the Project Boundary, but are located within 120m of project components that are not expected to have an operational impact on these habitats. In accordance with the Natural Heritage Assessment Guide (OMNR, 2011), 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.

Wildlife habitats that require generalized consideration were identified in **Section 4.4.4**, and include:

- Deer Winter Congregation Areaswithin 120m of Collector Lines, Transmission Lines, Access Roads and Turbines;
- Turtle Wintering Areaswithin 120m of Collector Lines, Transmission Lines and Turbines;
- Cliff and Talus Communities within 120m of Collector Lines and Transmission Lines;
- Other Rare Vegetation Communities within 120m of Collector Lines, Transmission Lines and Turbines; Rare Vegetation Species within 120m of Collector Lines and Transmission Lines;
- Amphibian Breeding habitats within 120m of Collector Lines, Transmission Lines and Turbines;

- Snake Hibernacula within 120m of Collector Lines, Transmission Lines and Turbines;
- Raptor Wintering Areas within 120m of Collector Lines and Transmission Lines;
- Woodland Raptor Nesting Habitat within 120m of Collector Lines, Transmission Lines, Access Roads and Turbines; and
- Woodland Area Sensitive Bird Breeding Habitat within 120m of Collector Lines, Transmission Lines, Access Roads and Turbines and
- Woodland Vole Habitat within 120m of Collector Lines, Transmission Lines, Access Roads and Turbines.

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 6.2, Appendix B)** of the Project.

6.9 PROVINCIAL PLAN AREAS

6.9.1 Protected Countryside of the Greenbelt

Portions of the Transmission Line route are proposed within the Protected Countryside of the Greenbelt. The Transmission Line has been proposed within the road right-of-way and the impacts to natural features and habitats within the Project Location within the Greenbelt Area have been assessed in other sections of the report.

Impacts to all wetlands have been considered, as required by the Greenbelt Plan, as all wetlands within 120m of the Project Location within the Greenbelt Plan area have been treated as significant for the purposes of this report.

No portion of the Transmission line is proposed within natural features or habitats and therefore no impacts are expected.

6.9.2 Niagara Escarpment Plan Area

Portions of the Transmission Line route are proposed within the Niagara Escarpment Plan Area. The Transmission Line has been proposed within the road right-of-way and the impacts to natural features and habitats within the Project Location within the Niagara Escarpment Area has been assessed in other sections of the report. No portion of the Transmission line is proposed within natural features or habitats and therefore no impacts are expected.

Potential impacts to the Niagara Escarpment will be addressed in a Development Permit application to be submitted and approved by the Niagara Escarpment Commission.

6.10 OTHER GENERAL MITIGATION MEASURES

A summary of construction related mitigation measures is provided in **Table 6.1** below, including the mitigation objective and specific location where each mitigation measure will be applied.

Table 6.1 Summary of Construction Phase Mitigation Measures Recommended

Mitigation Measure	Objective(s)	Location(s)
Any vegetation removal required along roadside collector and transmission lines will be minimized, and occur entirely within the road right-of-way.	Minimize vegetation removal and impacts on wildlife habitats	Collector Lines and Transmission Lines
Any accidentally damaged trees will be pruned through the implementation of proper arboricultural techniques	Protect tree species from permanent damage	Entire Project
Develop and implement an erosion and sedimentation control plan.	Protect natural features and wildlife habitats, where appropriate	Entire Project
Clearly delineate work area using silt fencing, erosion blankets, or similar barrier	Minimize erosion impacts on features when construction activities are proposed within 30m of significant natural features	Within 30m of any significant feature or wildlife habitat
Maintain erosion control measures for the duration of construction or decommissioning activities.	Minimize erosion impacts on features when construction activities are proposed within 30m of significant natural features	Within 30m of any significant feature or wildlife habitat
Suspend work if high runoff volume is noted or excessive sediment discharge occurs	Minimize erosion impacts on features when construction activities are proposed within 30m of significant natural features	Within 30m of any significant feature or wildlife habitat
No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive 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 vegetation buffers around water bodies	Minimize the potential for erosion, and protect wildlife habitat, within riparian areas	Entire Project
Avoid vegetation removal during the breeding bird season (May 1st-July 31$^{st)}$, or hire a biologist to confirm no nests are present in areas proposed for vegetation removal.	Avoid impacts to locally breeding bird species or nesting success	Entire Project
Construction activities will occur during daylight hours.	Avoid noise/light disturbance of local wildlife in areas where construction activity will occur within 30m of a significance feature or specific wildlife habitat type.	Within 30m of any significant feature or wildlife habitat
Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body	Limit the potential for increased erosion within 30m of significance natural features	Entire Project

Table 6.1 Summary of Construction Phase Mitigation Measures Recommended

Mitigation Measure	Objective(s)	Location(s)
All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m 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 significance 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	Within significant features or wildlife habitats
Minimize grading activities to maintain existing drainage patterns, to the fullest extent possible.	Maintain existing surface water drainage patterns	Entire Project
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
Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands.	Minimize impacts to ground water stores, wetlands, or water bodies	Entire Project
Control quantity and quality of stormwater discharge using best management practices.	Maintain water flow patterns similar to pre-construction conditions and avoid potential contamination of water sources	Entire Project
Horizontal directional drill entry/exit pits will be located at least 30m from any significant natural feature, and frac-out plan in place prior to performing directional drilling	Minimize impacts on significant natural features, water bodies, and wildlife habitat	Horizontal Directional Drilling
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

6.11 MONITORING

Post-construction and disturbance monitoring to demonstrate how any negative environmental effects identified in the Environmental Impact Study will be mitigated is required as part of the REA Application. This information is contained within the Environmental Effects Monitoring Plan, and is provided in the Design and Operations Report. In addition to the mitigation measures identified through the EIS, the Environmental Effects Monitoring Plan (EEMP) must include post-construction monitoring for birds and bats.

A post-construction monitoring study for birds and bats will be developed in consultation with the Ministry of Natural Resources that is consistent with guidance and requirements provided in MNR's Bat and Bat Habitat Guidelines (2011b) and MNR's Bird and Bird Habitat Guidelines (2010c).

Elements of the disturbance monitoring program, as described in the EEMP, will include:

- Mortality monitoring at 30% of the turbines from May 1- October 31, with raptor mortality surveys continuing to November 30th for a period of three years. Searcher efficiency and scavenger trials will be conducted each year according to MNR's protocols (2011b and 2011c).
- Regular reporting that includes analysis and submission of results to MNR.

Elements of the disturbance monitoring program, as described in the EEMP, will include:

- Potential disturbance effects to migratory birds survey: Surveys will be conducted to assess use of the Project area by spring and fall migrating landbirds. The number of species and the number of individual migratory landbirds will be monitored across a transect through a variety of habitats and compared to pre-construction conditions, two days per week from early April through end of May and from mid-August through end of October, for a period of three years.
- Post construction disturbance bat monitoring will be conducted in significant bat maternity features within 120m of turbines. Exit Surveys should be conducted at each significant habitat in June (30 minutes before dusk until 60 minutes after dusk) for a period of three (3) years.
- Potential disturbance effects to winter raptors and Short-eared Owls survey: Surveys will be conducted to assess use of the significant winter raptor feeding and roosting areas by Short-eared Owls and winter raptors within the Project area. The number of individual birds will be monitored across a wandering transect through a variety of habitats and compared to pre-construction conditions once every two weeks from November through to March for a period of three years.
- Potential disturbance effects to wetland and woodland hydrology: During construction, surveys will be conducted weekly in and adjacent to work areas to visually assess hydrological conditions. Hydrological conditions will also be monitored once seasonally in each of spring and summer during the first year of post-construction.

The monitoring program will be completed for 3 years and should be reassessed by MNR and NRWC at the end of each monitoring year. Pending the reassessment results, the program methodologies, frequencies, and durations may be reasonably modified by the parties to better reflect the findings.

Additional post-construction disturbance monitoring in significant wildlife habitats will include the following"

- Potential disturbance effects to significant woodland and wetland amphibian features: Post-construction monitoring for disturbance will be conducted for 1 year in amphibian features within 30m of access roads (ah2, ah9, ah25, ah29, ah31, ah32, ah35, ah37, ah38, ah49, ah55, ah57, ah61, ah83, and ah89). These will be conducted using the same protocols as the pre-construction surveys.

- Potential disturbance effects to significant turtle nesting habitat: Post-construction monitoring for disturbance will be conducted for 1 year within significant turtle nesting features within 30m of proposed access roads. These will be conducted using the same protocols as the pre-construction surveys

6.12 SUMMARY OF IMPACTS AND MITIGATION

The general impacts, suggested mitigation measures and application to minimize and mitigate the potential negative impacts to significant natural heritage features associated with the planning, design and construction of the proposed Project are summarized in **Table 6.1, Appendix B**.

7.0 Closure

This Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm has been prepared in accordance with O.Reg. 359/09, s. 24-28 and 37-38.

Once the identified protective, mitigation and compensation measures are applied to the environmental features discussed above, the construction and operation of the Project is expected to have no net negative effects on the significant features and functions identified through the Natural Heritage Assessment process. An environmental effects monitoring plan that includes a post-construction monitoring program will be developed to confirm the accuracy of predicted effects as well as to monitor the effects to other natural elements.

Stantec Consulting Ltd. prepared this Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm Project. NRWC is committed to implementing the appropriate protection and mitigation measures as they apply to the construction and operation of the proposed Project.

Respectfully Submitted,

STANTEC CONSULTING LTD

Shari Muscat, B.A., B.E.S.
Environmental Planner
Tel: (519) 575-4116
Fax: (519) 585-4239
shari.muscat@stantec.com

Chris Powell, M.A.
Project Manager, Environmental Planner
Tel: 519-585-7416
Fax: 519-585-4239
chris.powell@stantec.com

Shannon Catton, M.Sc.
Terrestrial Ecologist/Project Manager
Ph: (519) 836-6050 Ext. 277
Fx: (519) 836-2493
Shannon.Catton@stantec.com

8.0 Literature Cited

Bird Studies Canada. 2003. The Marsh Monitoring Program – Training Kit and Instructions for Surveying Marsh Birds, Amphibians and Their Habitats. 2003 Edition. 40 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. March 2003.

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

City of Niagara Falls. City of Niagara Falls Official Plan (2011) and associated Schedules and Appendices.

COSSARO. 2010. Species Classified by COSSARO and the Reasons for their Classification.

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists.

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

Grand River Conservation Authority (GRCA) watershed mapping. 2010. http://grims.grandriver.ca/imf/imf.jsp?site=grca_viewer&ddsid=7177c1

Haldimand County. June 2009. Haldimand County Official Plan.

IBA Canada. Undated. Important Bird Areas of Canada database; http://www.ibacanada.com/site.jsp?siteID=ON026&lang=EN

Land Information Ontario digital mapping.2009.Ontario Ministry of Natural Resources. Information Access Section, February 2012.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological land classification for Southwestern Ontario: first approximation and its application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC-005.

Ministry of Municipal Affairs and Housing. 2005. Greenbelt Plan. Queen's Printer for Ontario, 2005.

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

OMNR, Peterborough. Accessed January 2012. Available: http://nhic.mnr.gov.on.ca/MNR/nhic/queries/geographic.cfm.

Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario plant list. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON, Forest Research Information Paper No. 123. 550 pp. + appendices.

Niagara Escarpment Commission. 2011. Niagara Escarpment Plan.

Niagara Peninsula Conservation Authority (NPCA) regulation mapping. 2010. http://npca.ca/water-management/watershed-regulation/flood-plain-mapping.htm;

Niagara Peninsula Conservation Authority (NPCA). 2010. Natural Areas Inventory. Volume 1 and 2 2006-2009.

Niagara Region. Niagara Region Policy Plan.2010 and Core Natural Heritage Mapping. 2007

Norfolk County. Norfolk County Official Plan (2006) and associated Schedules and Appendices;

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

Oldham, M.J. and W.F. Weller. 2000. Ontario Herpetofaunal Atlas internet database. Natural Heritage Information Centre, Ministry of Natural Resources. Accessed February 7, 2007.http://www.mnr.gov.on.ca/MNR/nhic/herps/ohs.html

Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. 151 pp.

Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Decision Support System.

Ontario Ministry of Natural Resources. 2002. Ontario Wetland Evaluation System (OWES). Southern Manual.3rd Edition. Published 1993, revised December, 2002.

Ontario Ministry of Natural Resources. 2007. Guideline to Assist in the Review of Wind Power Proposals. Potential Impacts to Birds and Bird Habitat.Developmental Working Draft. August, 2007.

Ontario Ministry of Natural Resources. 2011a. Natural Heritage Assessment Guide for Renewable Energy Projects. 99 pp.First Edition. July, 2011.

Ontario Ministry of Natural Resources.2011b.Bats and Bat Habitats.Guidelines for Wind Power Projects.24 pp. July, 2011.

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

Ontario Ministry of Natural Resources. 2012. Draft Significant Wildlife Habitat Ecoregion 7E Criterion schedule (Online). Available: http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTE1ODc5&statusId=MTczNDgy&language=en

Ontario Ministry of Natural Resources. 1983. A summary report of the earth science areas of natural and scientific interest in Niagara district.

Ontario Ministry of Natural Resources. 1976.Significant Natural Areas along the Niagara Escarpment.

Ontario Partners in Flight (PIF). 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13), Priorities, Objectives and Recommended Actions. Environment Canada (Ontario Region) and Ontario Ministry of Natural Resources. Final Draft, February 15, 2006.

Rowe, J.S. 1972. Forest Regions of Canada. Ottawa, Canadian Forest Service. Pub.No. 1300. 172pp.

Stantec Consulting Ltd. 2012.Construction Plan Report for Cedar Point Wind Power Project. August 2012.

Town of Grimsby. 2011. Town of Grimsby Official Plan and associated Schedules and Appendices.

Appendix A

Figures

Appendix B

Tables

Table 3.1 Background Information Contact

Information Source and Contact Information	Records Requested	Records Received
Ontario Ministry of Natural Resources	Natural Heritage Assessment Data Request and Proposed Site Investigation Work Program (submitted February 1, 2011 and August 9, 2011).	Letter of response to Data Request provided August 25, 2011 and April 2, 2012 (see Appendix C)
	Ongoing regular consultation to identify natural features and their boundaries, evaluate significance, assess impacts of the project and identify mitigation measures.	Comments and information on the identification of natural features provided during ongoing consultation
	Project Development, Status and Timing Meeting (February 28, 2011)	Review of the field investigation requirements and field methodologies; discussion regarding survey requirements for Species at Risk (see Appendix C)
	Project Scope and Work Plan Meeting (August 30, 2011)	Review of MNR Guidelines, wildlife habitat concerns, REA overview, update on project changes to date, NHA requirements and additional requirements (see Appendix C)
	Project Update Meeting (June 19, 2012)	Reivew of additional reports to be submitted (APRD, ESA, EEMP, EIS, SAR, etc.), proposed timeline for submission, Eco-region criteria (see Appendix C)
Grand River Conservation Authority	Request for information regarding natural features, communities, species, watercourses or regulation limits that may influence the siting and design of the proposed wind farm (submitted on June 7, 2011)	Pre-consultation meeting November 17, 2011
Niagara Peninsula Conservation Authority	Request for information regarding natural features, communities, species, watercourses or regulation limits that may influence the siting and design of the proposed wind farm (submitted on June 7, 2011)	Letter of response to Data Request provided Sept 28, 2012
Grand River Conservation Authority & Niagara Peninsula Conservation Authority	Letter provided by Stantec with a copy of the Notice of Public Open House and request for a pre-consultation meeting (submitted on August 18, 2011)	Pre-consultation meeting November 17, 2011
	Joint Meeting (November 17, 2011)	Discussion regarding project update, REA overview, agency consultation, NHA and additional requirements (see Appendix C)

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Vegetation								
Swamp Rose-Mallow	Hibiscus moscheutos	S3	SC	SC	NHIC	Found in river bottoms and marshes, as well as their neighbouring disturbed ground (Reznicek et al. 2011).	**Potential habitat for this species is not likely to occur within the study area**. All project components are located outside of any lakeshore marsh habitat.	No
Shumard Oak	Quercus shumardii	S3	SC	SC	NHIC	Moist slopes, banksides, bottomland, and poorly-drained upland (Nixon, 1997).	**Potential habitat within the study area** occuring in fresh-moist forests and swamp communities.	No
Broad Beech Fern	Phegopteris hexagonoptera	S3	SC	SC	NHIC	Occurs in moist areas of rich deciduous forests such as the base of slopes and along seeps and streams (Reznicek et al. 2011).	**Potential habitat within the study area** occuring in undisturbed forest communites.	No
Green Dragon	Arisaema dracontium	S3	SC	SC	NHIC	Flowering late spring; mesic to wet deciduous woods, thickets, and bottomlands (Thompson, 2000)	**Potential habitat within the study area** occurring in fresh-moist forest community.	No
Black Cohosh	Actaea racemosa	S2			NHIC	Flowering summer (late Jun to late August). Moist, mixed deciduous forests, wooded slopes, ravines, creek margins, thickets, moist meadowlands and forest margins (Ramsey, 1997).	**Potential Habitat within the study area** occuring in forest communities.	No
Pawpaw	Asimina triloba	S3			NHIC	Occurs on the rich moist soils of floodplains and wet woods; in colonies as an understory tree; shade-tolerant (Farrar, 1995).	**Potential habitat within the study area** occuring along creek, river and stream floodplains and in the understory of wet forest communities.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Cooper's Milk-vetch	Astraglus neglectus	S3			NHIC	Flowering late spring - early summer (Gleason and Cronquist 1991). Marshy to dry open, sometimes rocky clearings, shores, thickets, and river banks; often in calcareous sites (Voss, 1985). Primarily a species of alvars, open woodlands, and woodland edges (Oldham pers. comm. 1997)	**Potential habitat within study area** occuring in open habitats with calcareous soils.	No
Downy Yellow False Foxglove	Aureolaria virginica	S1			NHIC	Prefers dry-mesic, open oak, and woodland slopes. Tolerates/benefits from some periodic disturbances that maintain a relatively open canopy (McLeod 1990). At the extant Ontario sites, A. virginica is associated with various combinations of black oak (Quercus velutina), red oak (Quercus rubra) and white oak (Quercus alba), with white oak being present at every site. (NHIC,2012).	**Potential Habitat within the study area** occuring in Dry oak forest communities with relatively open canopy.	No
Yellow Bartonia	Bartonia virginica	S2			NHIC	Occurs in wet meadows and sphagnum bogs (Gleason and Cronquist, 1991).	**Potential Habitat within the Study area** occuring in wet meadow communities.	No
Crowned Beggarticks	Bidens trichosperma	S2			NHIC	Wet meadows and swamps; flowers late summer and fall (Newcomb, 1977).	**Potential habitat within the study area** occuring in wet meadow and swamp communites.	No
Pignut Hickory	Carya glabra	S3			NHIC	Flowering spring. Well-drained sandy soils, rolling hills and slopes, dry rocky soils, or thin soils on edge of granite outcrops (Stone, 1997).	**Potential habitat within the study area** occuring on dry well drained forest sites with sandy soils.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Shellbark Hickory	Carya laciniosa	S3			NHIC	Occurs on moist to wet sites, in valleys and along stream banks; mixed with other broadleaf trees (Farrar, 1995).	**Potential Habitat within the study area** occuring along streambanks and in wet to moist forest sites.	No
Village Goosefoot	Chenopodium berlandieri var. bushianum	S1S2			NHIC	Occurs in disturbed areas, most frequently in cultivated ground but also in floodplains, river banks, and forests (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in disturbed sites and along riverbanks, floodplains and wet to moist forest sites.	No
Yellow Corydalis	Corydalis flavula	S2			NHIC	Found in moist, loose soil on forested rock outcrops, slopes and bottomlands (Stern, 2003).	**Potential Habitat within the study area** occuring on slopes and bottomland forest with moist loose soil.	No
Dunbar's Hawthorn	Crataegus beata	S1			NHIC	Like most hawthorns, typically occurs in disturbed or successional sites such as forest edges, pastures, and stream sides (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in disturbed and succesional sites as well as forest edges and pasture Hedgerows.	No
Northern Hawthorn	Crataegus pruinosa var. dissona	S3			NHIC	Like most hawthorns, typically occurs in disturbed or successional sites such as forest edges, pastures, and stream sides (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in disturbed and succesional sites as well as forest edges and pasture Hedgerows.	No
Buttonbush Dodder	Cuscuta cephalanthi	S2			NHIC	Found wherever their host plants occur, which include species of buttonbush, elderberry, meadowsweet, horsetail, hog peanut, horehound, and poplar (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in any communities which include host species, Buttonbush and meadowsweet thickets are found throughout the site.	No
Prostrate Tick-trefoil	Desmodium rotundifolium	S2			NHIC	Barrens and dry forests (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in dry forest forest sites and open ridges and hilltops.	No
Burning Bush	Euonymus atropurpureus	S3			NHIC	Found in moist woods (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** in wet to moist forest sites.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Schreber's Wood Aster	Eurybia schreberi	S2S3			NHIC	Moist deciduous and mixed woods, thickets, and shaded roadsides (Brouillet, 2006).	**Potential Habitat within the study area** in wet to moist forest sites and shady roadside thickets and forb meadows.	No
Pumpkin Ash	Fraxinus profunda	S2?			NHIC	Grows in wet forests and swamps (Gleason and Cronquist, 1991).	P**otential Habitat within the study area** occuring in low lying swamps and consistently wet forest communities.	No
Hairy Bedstraw	Gallium pilosum	S3			NHIC	Dry woods and thickets; fields and grasslands (Gleason and Cronquist, 1991; Newcomb, 1977; Reznicek et al., 2011).	**Potential habitat within the study area** occuring in dry forest communities and open grassland communities.	No
Honey Locust	Gleditsia triacanthos	S2			NHIC	Found in moist bottomlands mixed with other deciduous trees (Farrar, 1995).	**Potential Habitat within the study area** occuring in bottomland forest communities.	Yes, observed outside of the Project Location, within the 120 m Zone of Investigation.
Panicled Hawkweed	Hieracium paniculatum	S2?			NHIC	Found in the openings of forests (Strother, 2006)	**Potential Habitat within the study area** occuring in forest community openings.	No
Eastern Green-violet	Hybanthus concolor	S2			NHIC	Found in Rich woods (Newcomb, 1977)and in moist, shady sites in ravines and on rocky slopes, also on floodplains, in rich, calcareous soils.	**Potential Habitat within the study area** occuring within the Niagara Escarpment.	No
Hairy Pinweed	Lechea mucronata	S3			NHIC	Found in dry or sandy soil in open forests and fields (Gleason and Cronquist, 1991)	**Potential Habitat within the study area** occuring in dry forest sites with relatively open canopy.	No
Woodland Flax	Linum virginianum	S2			NHIC	Upland forests, hillsides, and banks (Reznicek et al., 2011).	**Potential Habitat within the study area** occuring in upland forest sites and slope terrain.	No
Many-fruit Primrose-willow	Ludwigia polycarpa	S2S3			NHIC	Wet prairies, marshes, and swamps (Gleason and Cronquist, 1991)	**Potential Habitat within the study area** occuring in meadow marshes and swamp communities.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Sundial lupine	Lupinus perennis	S3			NHIC	Dry, open forests and clearings (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in dry forest sites and forest openings.	No
Taper-leaved Bugleweed	Lycopus rubellus	S3			NHIC	Occurs in swamps and floodplains and occasionally in moist, open ground (Reznicek et al., 2011).	**Potential Habitat within the study area** occuring in swamp communities and floodplains.	No
Virginia lungwort	Mertensia virginica	S3			NHIC	A hairless plant with a waxy white cast, found along rich floodplains of southern Ontario (Dickenson et al., 2004)	**Potential Habitat within the study area** occuring in floodplain communities occuring near creeks and rivers.	No
Sharp-winged Monkeyflower	Mimulus alatus	S2			NHIC	Occurs in wet woods and shaded streambanks (Gleason and Cronquist, 1991)	**Potential Habitat within the study area** in wet forest communities and along streambanks.	No
Scarlet Beebalm	Monarda didyma	S3			NHIC	Mesic thickets and woods (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in moist thickets and forest communities.	No
Northern Bayberry	Morella pensylvanica	S1			NHIC	Occurs on coastal dunes, in pine barrens and pine-oak forests, fields, bogs, ponds, along the edges of streams, and in swamps (Bornstein, 1997).	**Potential Habitat within the study area** occuring along edges of streams and in swamp communities.	No
Oil-field Toadflax	Nuttallanthus canadensis	S1			NHIC	Occurs in dry, open and sandy or rocky terrain, often with oaks or jack pine, and in dry lake beds (Reznicek et al., 2011)	**Potential Habitat within the study area** occuring in dry communites which are open and sandy.	No
Black Gum	Nyssa sylvatica	S3			NHIC	Occurs as an understory tree on low, wet ground along streams or in swamps. Moderately shade-tolerant (Farrar, 1995).	**Potential Habitat within the study area** occuring along streams and in swamp communities in the understory.	No
Pillose Evening Primrose	Oenothera pilosella ssp. pilosella	S2			NHIC	Moist fields, meadows, and open woods (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in moist cultural meadows and forest communites and woodlands with relatively open canopies.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Soft-hairy False Gromwell	Onosmodium bejariense var. hispidissimum	S2			NHIC	Moderately dry, open places (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in open canopy communites which are realitvely dry.	No
Cluster-stemmed Nailwort	Paronychia fastigiata var. fastigiata	S1			NHIC	Found in dry woods and openings (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in dry forest communities and canopy openings.	No
Halberd-leaved Tearthumb	Persicaria arifolia	S3			NHIC	Occurs in swamps and wet ground along streams and lakes (Reznicek et al., 2011).	**Potential Habitat within the study area** occuring in swamp communities and along waterways.	No
Moss Phlox	Phlox subulata ssp. subulata	S1			NHIC	Often a garden escapee; occurs in sandy and gravelly soil or rock-ledges in clearings, shores, banks, and roadsides (Reznicek *et al* ., 2011; Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in open communities with sandy or rocky soil along rock ledges, banks and roadsides.	No
Dwarf Chinquapin Oak	Quercus prinoides	S2			NHIC	Usually on deep sand or dry shale, less often on calcareous soil; found at the edges of forests, in pine barrens, prairies, and exposed ridges (Nixon, 1997).	**Potential Habitat within study the area unlikely**, occuring in dry sandy forest communities at forest edges.	No
Skunk Meadow-rue	Thalictrum revolutum	S2			NHIC	Occurs in moist and lightly shaded areas along streams, rivers, and meadows (Reznicek et al., 2011).	**Potential Habitat within the study area** occuring in shaded moist communities along waterways and meadows.	No
Carolina vetch	Vicia caroliniana	S2			NHIC	Woods and thickets (Newcomb, 1977)	**Potential Habitat within the study area** occuring in dedious forest communities and thicket communities.	No
Palmate-leaved Violet	Viola palmata	S2S3			NHIC	Found in dry forests with oak, hickory, beech and/or maple, as well as thickets (Reznicek et al., 2011).	**Potential Habitat within the study area** occuring oak or maple communities.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Round-leaved Yellow Violet	Viola rotundifolia	SH			NHIC	Usually occurs in rich coniferous forests (Gleason and Cronquist, 1991).	**Unlikely to occur within the study area**, rich coniferouse forests were not Identified during ecological land classification.	No
Blunt-lobed Grapefern	Botrychium oneidense	S3?			NHIC	Prefers moist, shady young hardwood stands, floodplain forests and swamps (Cobb et al., 2005).	**Potential Habitat within the study area** occuring in moist forest communities and swamps or along floodplains.	No
Lowland Brittle Fern	Cystopteris protrusa	S2			NHIC	In rich, moist forests (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in moist fores communites with rich soils.	No
Purple-stemmed Cliff-brake	Pellaea atropurpurea	S3			NHIC	Grows on talus slopes, rocky outcrops, ledges, and low cliffs (Reznicek et al. 2011).	**Potential Habitat within the study area** occuring in talus and cliff communities within the niagara escarpement.	No
Narrow-leaved Wild Leek	Allium tricoccum var. burdickii	S1?			NHIC	Rich deciduous forests, often on floodplains, but occasionally also in upland oak-hickory forests (Reznicek et al. 2011).	**Potential Habitat within the study area** occuring in moist forest communities and floodplains.	No
White-tinged Sedge	Carex albicans var. albicans	S3			NHIC	Occurs mostly in the dry acidic soils overlying sandstone and granite, but also less commonly in calcareous regions, in deciduous forests or under cedars, and on forested slopes and ridges (Ball and Reznicek, 2002).	**Potential Habitat within the study area unlikely**, occuring in deciduous forest communities and on forested ridges and slopes.	No
Emmon's White-tinged Sedge	Carex albicans var. emmonsii	S2			NHIC	Most often occurs on wet to moist soil on slopes in lightly-shaded deciduous forests, but also in sandy-loam soil under mixed deciduous – pine forests (Ball and Reznicek, 2002).	**Potential Habitat within the study area** occuring in wet to moist forest communities in shaded conditions.	No
Carey's Sedge	Carex careyana	S2			NHIC	Found growing only in rich, deciduous forests (Voss, 1972).	**Potential Habitat within the study area** in rich calcareous deciduous forest communities.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Davis' Sedge	Carex davisii	S2			NHIC	Occurs in rich deciduous forests and forest edges, most often along ditches and streams, forested ravines, and also thickets, meadows and fields (Ball and Reznicek, 2002).	**Potential Habitat within the study area** occuring along ditches an streams and forested ravines.	No
Blue Sedge	Carex glaucoidea	S1			NHIC	Fruiting spring–early summer. Mesic to wet-mesic deciduous forests or seasonally moist prairies, usually in clays or loams (Ball and Reznicek, 2002).	**Potential Habitat within the study area** occuring in clay loam sites with deciduous forest communities.	No
Hairy Green Sedge	Carex hirsutella	S3			NHIC	Fruiting late spring–early summer. Meadows, dry to mesic woods, neutral to basic soils. More frequent in open, non-forested habitats (Ball and Reznicek, 2002).	**Potential Habitat within the study area** occuring in open communities that are dry to moist.	No
Eastern Few-fruited Sedge	Carex oligocarpa	S3			NHIC	Found in calcium-rich loam on rocky slopes above streams in fresh deciduous forests (Ball and Reznicek, 2002).	**Potential Habitat within the study area** occuring on slopes and stream banks in calcareous forest communities.	No
Weak Stellate Sedge	Carex seorsa	S2			NHIC	Fruiting late spring–early summer. Acidic, sandy, peaty hardwood or thickets swamps. Very rarely hybridizes with C. *atlantica* (Ball and Reznicek, 2002).	**Potential Habitat within the study area** occuring in thicket swamp communities and acidid hardwood forest comunities.	No
Ribbed Sedge	Carex virescens	S3			NHIC	Scarce in dry, often sandy woods or rarely in moist open or shaded ground (Voss, 1972).	**Potential Habitat within the study area** occuring in dry sandy forest communities.	No
Wildenow's Sedge	Carex wildenowii	S1			NHIC	Fruiting spring–summer (late Apr–late Jul). Acidic, dry mesic, open, oak-dominated woodlands, often on ridges and slopes (Flora of North America, 2008).	**Potential Habitat within the study area** occuring in oak dominated communities which are dry to moist particularly on slopes or ridges.	No
Coast Barnyard Grass	Echinochloa walteri	S3			NHIC	Found in wet places such as ditches, marshes, and the banks of rivers and ponds (Reznicek et al. 2011).	**Potential Habitat within the study area** occuring in open wet communities.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Sharp-fruited Rush	Juncus acuminatus	S3			NHIC	Wet soil in lowland forests, meadows, and shorelines (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring In lowland forest communities.	No
Slim-flowered Muhly	Muhlenbergia tenuifolia	S2			NHIC	Usually found on rocky or sandy slopes within upland deciduous forests (Peterson, 2003)	**Potential Habitat within the study area** occuring in upland forest communities, in particular sites with rocky or sandy slopes.	No
Crested Arrowhead	Sagittaria cristata	S3			NHIC	Found along sandy margins and at the bottoms of lakes, ponds, and swamps (Haynes and Hellquist, 2000)	**Potential Habitat within the study area** occuring in permanent marsh, stream and swamp communities or along sandy margins of waterbodies.	No
Low Nutrush	Scleria verticillata	S3			NHIC	Grows in marshes, savannas, meadows, and bogs in wet marly, peaty, or sandy soils (Reznicek et al., 2003)	**Potential Habitat within the study area** occuring in wet communities with open canopy cover and marly, peaty or sandy soils.	No
Shiny Wedge Grass	Sphenopholis nitida	S1			NHIC	Grows on clay and silt slopes and banks in deciduous or coniferous forests (Daniel, 2007).	**Potential Habitat within the study area** occuring on clay and silt slopes in deciduous forest communities.	No
Prairie Wedge Grass	Sphenopholis obstusata	S1			NHIC	Found in moist meadows and along the shores or banks of lakes and streams (Gleason and Cronquist, 1991).	**Potential Habitat within the study area** occuring in open wet habitats along shores and banks of lakes and streams.	No
Perfoliate Bellwort	Uvularia perfoliata	S1			NHIC	Found in acid to neutral soil in deciduous forests and dry thickets (Utech and Kawano, 2002).	**Potential Habitat within the study area** occuring in dry forest and thicket communities.	No
Amphibians								

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Jefferson X Blue-spotted Salamander, Jefferson genome dominates	Ambystoma hybrid pop. 1	S2			NHIC	The Jefferson salmander is terrestrial during its adult stage but requires vernal pools associated with upland deciduous forest for breeding. In order for juvenile salamanders to survive in these ponds, the ponds should not contain fish. After breeding is completed, the species moves back to the upland forest where it lives underground in rodent burrows (COSEWIC, 2010).	**Potential Habitat within the study area** occuring in all Deciduous forests which include vernal pools.	No
Birds								
Wood Thrush	Hylocichla mustelina	S4B		THR	NHIC	Interior and edges of deciduous and mixed forests, especially well-developed, upland, mesic ones. Key elements of oft-used sites: trees >16 m in height, high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter. (Birds of North America Online)	**Potential Habitat within the study area** occuring in deciduous and mixed forest communities.	No
Short-eared Owl	Asio flammeus	S2N,S4B	SC	SC	NHIC	These owls inhabit open habitats such as agricultural lands, wetlands, and grasslands. This area sensitive species nests on the ground usually in tall vegetation and typically requires 75 hectares of suitable habitat in order for nesting to occur. Breeding area on any given year is strongly correlated to small rodent abundances (Clark, 1975).	**Potential habitat within the study area** occuring in large meadow and cattail marshes, and old wet fields, greater than 75 ha which occur in the site.	Yes

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
White-eyed Vireo	Vireo griseus	S2B			NHIC	In its breeding grounds the white eyed vireo inhabits early to late successional habitats such as deciduous scrub, abandoned fields and pastures, regenerating logged areas, streamside thickets, the edges of forests, and reclaimed strip mines. It forages for insects and fruit in woody vegetation and is known to feed on grapes, sumac, and dogwood (NatureServe, 2011)	**Potential Habitatt within the study area** occuring in woodlands, thickets, forest edges and fallow fields.	No
Black Tern	Chlidonias niger	S3B	SC	NAR	NHIC	The Black Tern is a small tern that nests semicolonially in freshwater marshes with emergent vegetation. This species prefers marshes or marsh complexes of more than 20 ha in size for breeding (Dunn and Agro, 1995).	**Potential Habitat within the study area** occuring in large marshes with emergent vegetation of more than 20ha in size.	No
Bald Eagle	Haliaeetus leucocephalus	S1S2N ,S4B	SC		NHIC	The Bald Eagle almost always nests near water, usually on large lakes. Large stick nests are placed in trees located within mature woodlots. They usually require 250 ha of mature forest for breeding, however, along Lake Erie, where the lake provides a valuable food source, the eagles will nest in smaller woodlots or even single trees (Sandilands, 2005).	**Potential Habitat within the study area** occuring along the shoreline of Lake Erie and the Welland river and associated riparian zone and forests.	Yes (during migratory surveys)

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Louisiana Waterthrush	Seiurus motacilla	S3B	SC	SC	NHIC	In Ontario, the species prefers deciduous and mixed forests with a strong Eastern Hemlock component, in deeply incised ravines (Cadman et al. 2007). It will also inhabit large flooded tracts of mature deciduous swamp forest.	**Potential Habitat within the study area** occuring particularly within the NEC lands along the niagara escarpement along fast flowing streams found within this habitat.	No
Common Nighthawk	Chordeiles minor	S4B	SC	THR	NHIC	The Common Nighthawk is an aerial insectivore and forages at dawn and dusk. Common Nighthawks nest on the ground in open habitats preferably with rocky or graveled substrate. Nighthawks will even nest on gravel roofs in the city. The regeneration or succession of forest clearings and the destruction of grassland habitats appear to play a major role in this species' decline along with the non-selective spraying for mosquitoes (Cadman et al., 2007).	**Potential Habitat within the study area** occuring in any habitat which includes, grasslands, agricultural fields, gravel pits and pastures, which are found throughout.	No
Hooded Warbler	Wilsonia citrina	S3B	SC	THR	NHIC	The Hooded Warbler can be found in mature, upland deciduous or mixed forest, with an area of more than 15 hectares, where clearings have been created naturally or by logging (Evans Ogden and Stutchbury, 1994). It prefers clearings with low, dense, shrubby vegetation less than two meters in height.	**Potential Habitat within the study area**, occuring in clearings within woodlots with low dense shrubby vegetation.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Canada Warbler	*Wilsonia canadensis*	S4B	SC	THR	OBBA	The Canada Warbler is usually found in moist mixed deciduous-coniferous forests with a well-developed understorey. It may also occur in shrub marshes, red maple stands, coniferous riparian woodlands, ravines and steep brushy slopes, and regenerating forests. It is estimated that about one third of the Canada Warbler population breeds in Ontario(COSEWIC 2008; COSSARO 2009).	**Potential habitat within the study area,** occuring in shrub marshes, regenerating forests and red maple stands.	Yes (during migratory surveys)
Red-headed woodpecker	*Melanerpes erythrocephalus*	S4	SC	THR	OBBA	The Red-headed Woodpecker Occupies a wide range of habitats, but most are characterized by open areas for feeding; snags for roosting, and a secure food supply. This species requires multiple snags for nesting, roosting, and foraging. Some of the habitats used are: open deciduous and riparian woodlands, orchards, parks, agricultural lands, savanna-like grasslands, beaver ponds with snags, forest edges, burned forests, and flooded bottomland forests. (N.A.S., 2012)	**Potential Habitat within the study area** occuring in bottomlands, swamps, forest edges and grasslands with multiple snags.	Yes (during migratory surveys)

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Golden-winged Warbler	*Vermivora chrysoptera*	S4B	SC	THR	OBBA	The Golden-winged Warbler is a provincial species of special concern and a federally threatened species. It is confined to southern Ontario with local concentrations along the southern edge of the Canadian Shield, primarily around southeastern Georgian Bay and north of Kingston. Breeding occurs in successional scrub habitats bordered by forests and nests are constructed on the ground.	The Ontario Breeding Bird Atlas observations within the study area did not distinguish Golden-winged warbler from blue-winged warbler, further the study area is located well to the south of the normal range for Golden-winged warblers**.** As a result **potential habitat for this species is unlikely to occur.**	No
Yellow-breasted Chat	Icteria virens	S2B	SC	END	NHIC	The Yellow-Breasted Chat is not widespread in Ontario, but most records from the province are from the Carolinian region (Eagles, 1987). This species prefers early second-growth forest and shrub in abandoned agricultural fields, fencerows, forest edges and openings, and near streams (Eckerle and Thompson, 2001). In Ontario, it is usually found in shrubby tangles and deciduous thickets (Eagles, 1987).	**Potential Habitat within the Study area** occuring in shrubland and thickets, fallow fields and fencerows.	No
Reptiles								
Milksnake	Lampropeltis triangulum	S3	SC	SC	NHIC	Eastern milksnake occurs throughout southern Ontario and is considered uncommon and local throughout its range (Lamond, 1994). Eastern milksnake favour open woodlands, fields and farm buildings and are commonly associated with rural areas.	**Potential Habitat within the study area** occuring in a variety of habitats, including forested areas, human habitation areas including structures for hibernation, fields, woodlands and valley bottoms.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Northern Map Turtle	Graptemys geographica	S3	SC	SC	NHIC	Map turtles inhabit slow moving, large rivers and lakes with high water quality and soft bottoms (Toronto Zoo, No date), often congregating at favoured basking (e.g., rocks and logs at water edges) and overwintering (e.g., bottom of lakes and rivers) sites (MacCulloch, 2002).	**Potential habitat for this species is not likely to occur within the study area.** All project components are not located adjacent to any large bodies of water which the northern map turtle would require.	No
Snapping Turtle	Chelydra serpentina	S3	SC	SC	NHIC	Snapping Turtles inhabit ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms. Females nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC, 2008).	**Potential Habitat within the study area** occuring in any open water marsh areas, slow moving mud bottom creeks and ponds which are present throughout the study area.	No
Eastern Ribbonsnake	Thamnophis sauritus	S3	SC	SC	NHIC	The eastern ribbon snake is usually found close to water and is particularly characteristic of wetlands that are associated with large wooded areas (Lamond, 1994).	**Potential Habitat within the study area** occuring in swamp, marsh, and creek habitat particularly with densly vegetated edges.	No
Insects								
Monarch Butterfly	Danaus plexippus	S2N,S4B	SC	SC	NHIC	In southern Ontario the Monarch is considered common and exists primarily wherever milkweed and wildflowers exist. This includes abandoned farmland, along roadsides, and other open spaces where these plants grow.	**potential habitat within the study area** occuring in cultural meadows and any communities which include higher proportions of their host plant, common milkweed,and wildflowers	Yes

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Giant Swallowtail	Papilio cresphontes	S3			NHIC	More common southwards, in Ontario larvae have been recorded on common hop-tree (*Ptelea trifoliata*) and prickly ash (*Zanthoxylum americanum*). Adults can be found flying in open forests and nearby fields (Layberry et al. 1998).	**Potential Habitat within the study area** occuring in communities which include host plants, common hop-tree is present within the study area.	No
Mottled Darner	Aeshna clepsydra	S3			NHIC	Can be found near shallow ponds, bays, and marshes at the edges of lakes; will gather above hilltops in large feeding swarms of hundreds of adults (Catling and Brownell, 2000)	**Potential Habitat within the stuy area** occuring in all marsh and pond wetland communities with permanent standing water.	No
Unicorn Clubtail	Arigomphus villosipes	S2S3			NHIC	The Unicorn Clubtail inhabits ponds and sluggish streams with little emergent vegetation and mucky bottoms. This species is found frequently on the ground, typically on areas with exposed soil (Jones *et al.,* 2008).	**Potential Habitat within the stuy area** occuring in all marsh and pond wetland communities with permanent standing water.Particularly in areas with little to no vegetation and mud creek bottoms.	No
Azure Bluet	Enallagma aspersum	S3			NHIC	In southern Ontario, this species has become adapted to man-made ponds and is typically found in shallow, often temporary and fishless, pools and ponds that entirely freeze in the winter (Catling and Brownell, 2000).	**Potential Habitat within the study area** occuring in fishless ponds and temporary pools.	No
Swamp Darner	Epiaeschna heros	S2S3			NHIC	Can be found near forest pools, ponds and ditches (Catling and Brownell, 2000)	**Potential Habitat within the stuy area** occuring in all ditches, forest poools and pond communities with permanent standing water.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Cyrano Darner	Nasiaeschna pentacantha	S3			NHIC	The Cyrano Darner's primary habitat is slow streams and lakes, but the adults are also known to forage in and around forests, where they are infrequently observed (Jones et al., 2008).	**Potential Habitat within the stuy area** occuring around all stream communities and near forests.	No
Arrow Clubtail	Stylurus spiniceps	S2			NHIC	The Arrow Clubtail inhabits lakes and rivers, and can be seen flying at dusk as well as at mid-afternoon in the centre of large rivers (Catling and Brownell, 2000).	**Potential Habitat within the stuy area** occuring near large river communities.	No
Variegated Meadowhawk	Sympetrum corruptum	S3			NHIC	This species is generally associated with a variety of aquatic habitats, occuring in lakes, ponds and slow streams (Catling and Brownell, 2000).	**Potential Habitat within the stuy area** occuring in all streams,marsh, swamp and pond wetland communities with permanent water.	No
Mammals								
Woodland Vole	Microtus pinetorum	S3?	SC	SC	NHIC	This species is found mainly in densely shrubby or wooded areas that contain sandy soils for easier burrowing. They can sometimes be found in densely grassy areas (Eder, 2002).	**Potential habitat within the study area** occuring in deciduous forests with sand soils, shrublands and woodland habitats with a high grass component.	No
Small-footed Bat	Myotis leibii	S2S3			NHIC	This bat inhabits deciduous and coniferous forests, roosts in crevices or under bark, and hibernates in caves and mines (Reid, 2006).	**Potential Habitat within the study area** Occuring in forests which contain suitable standing snags, as well as cliff and talus communities.	No

Table 3.2 Species of Special Concern Assessment

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	National Status (COSEWIC)	Record Review Source	Description of Breeding Habitat and known occurences	Results of site investigation	Species Observed during site Investigations
Eastern Pipistrelle	Pipistrellus subflavus	S3?			NHIC	The Eastern Pipistrelle prefers partly open habitat such as fields with large trees or woodland edges while avoiding both denser and more open areas. It likely roosts in leaves, caves or buildings in the summer, and hibernates in caves and mines where the humidity is high. Maternity colonies are usually found either in tree cavities or man-made structures, but in at least parts of their range they have also been recorded utilizing live and dead foliage as well as squirrel nests. They generally forage at canopy height over open water (NatureServe 2011).	**Potential Habitat within the study area** Occuring in forests, fields or woodland edges which contain suitable standing snags near open water.	No

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
WETLANDS								
Provincially Significant Wetland/Coastal Wetland	154 wetlands in 16 PSW Complexes	9 wetlands in the Project Location	Turbines, Access Roads, Collector Lines, Transmission Lines, Laydown Areas	88 wetlands in 16 PSW Complexes	None	Turbine, Access Road, Collector Line, Transmission Line, Collector Line ROW (Horizontal Direction Drill - Collector Lines for Substation and Turbines T01, T55, T66, T75)	88 Provincially Significant Wetlands	Yes
Locally Significant Wetland	7 wetlands in 4 LSW Complexes	None	Turbines, Access Roads, Collector Lines, Transmission Lines, Laydown Areas	5 wetlands in 4 LSW Complexes	None	Turbine, Access Road, Collector Line, Transmission Line, Collector Line ROW	Not Significant	No
Unevaluated Wetland	803 wetlands	13 wetlands within the Project Location	Turbines, Access Roads, Collector Lines, Transmission Lines, Laydown Areas	64 unevaulated wetlands	None	Turbine, Access Road, Collector Line, Transmission Line, Collector Line ROW (Horizntal Direction Drill - Collector Lines for Turbines T13, T32, T49)	64 unevaluated wetlands treated as significant	Yes
WOODLANDS								

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Woodlands	253 woodlands	12 woodlands within the Project Location	Turbines, Access Roads, Collector Lines, Transmission Lines, Laydown Areas	215 Candidate Significant Woodlands	None	Turbine, Access Road, Collector Line, Transmission Line, Collector Line ROW (Horizontal Directional Drilling under 7 woodlands; wo66, wo105, wo113, wo119, wo153, wo 191, wo194)	104 Significant Woodlands	Yes
SIGNIFICANT WILDLIFE HABITAT- SEASONAL CONCENTRATION AREAS								
Deer winter congregation areas	118 features identified by MNR	14 in the Project Location	Turbine, Access Road, Collector Line, Transmission Line	MNR identified 118 Deer winter congregation areas	None	Turbine, Access Road, Collector Line, Transmission Line, Collector Line ROW (Horizntal Direction Drill - Collector Lines for Turbines T49, T66, T75)	Generalized	Yes
Colonial bird nesting sites (bank and cliff)	Unknown	n/a	n/a	Candidate significant wildlife habitat for Colonial nesting birds did not occur in or within 120m of the project location	n/a	n/a	n/a	n/a

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Colonial bird nesting sites (tree/shrub)	Unknown	n/a	n/a	Candidate significant wildlife habitat for Colonial nesting birds did not occur in or within 120m of the project location	n/a	n/a	n/a	n/a
Colonial bird nesting sites (ground)	Unknown	n/a	n/a	Candidate significant wildlife habitat for Colonial nesting birds did not occur in or within 120m of the project location	n/a	n/a	n/a	n/a
Waterfowl stopover and staging areas (terrestrial)	Unknown	n/a	n/a	Candidate significant wildlife habitat for waterfowl stopover and staging areas did not occur in or within 120m of the project location	n/a	n/a	n/a	n/a

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Waterfowl stopover and staging areas (aquatic)	Unknown	n/a	n/a	Candidate significant wildlife habitat for waterfowl stopover and staging areas did not occur in or within 120m of the project location	n/a	n/a	n/a	n/a
Shorebird migratory stopover areas	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a
Landbird migratory stopover areas	Unknown	n/a	n/a	Identified presence of 5 candidate significant wildlife habitat feature mlsa1-5	None	Turbine (T14, T16, 21, T22, T44, T45, T61), Collector Line, Access Roads	mlsa1	Yes
Raptor wintering areas	Unknown	n/a	n/a	Identified presence of 7 candidate significant wildlife habitat features (wr1-7)	Turbine, Access Road, Collector Line (T59, T60) with wr5	Turbine (T58 - wr4), Access Road (T58-wr4, T25-wr2), Collector Line (T58-wr4, T38-wr1). Horizontal Directional Drill - Collector Lines (T01-wr3, T75-wr2)	wr1, wr2, wr4 and wr5 (wr3 generalized)	Yes
Bat hibernacula	Unknown/ none identified	n/a	n/a	None	n/a	n/a	n/a	n/a
Bat maternity colonies	Unknown/ none identified	n/a	n/a	None	n/a	n/a	n/a	n/a

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Bat migratory stopover areas	Unknown/ none identified	n/a	n/a	None	n/a	n/a	n/a	n/a
Turtle wintering areas	Unknown	n/a	n/a	The Wellend River was identified	n/a	n/a	Generalized	n/a
Snake hibernaculum	Unknown	n/a	n/a	Identified presence of 6 candidate significant wildlife habitat features (sh2, sh3, sh4, sh5, sh6 and sh7)	None	Collector Line ROW, Access Road (T11, T55, T36), Transmission Line (T93), Collector Line (T11, T55, T36)	sh2, sh3, sh4, sh6 and sh7 assumed significant (sh5 generalized)	Yes
Migratory butterfly stopover areas	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a
SIGNIFICANT WILDLIFE HABITAT- RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITATS								
Rare Vegetation Communities	Unknown	n/a	n/a	6 rare vegetation communities	None	Access Roads, Turbines, Collector Lines	rv2 and rv3 considered Significant (rv1, rv4, rv6, rv7 Generalized), CIO1 and TAT1-7* Generalized	Yes
Waterfowl nesting area	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a
Bald Eagle and Osprey nesting, foraging, and perching habitat	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Woodland raptor nesting habitat	Unknown	n/a	n/a	9 candidate woodland habitats (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212)	None	Access Roads, Turbines, Collector Lines	Generalized	Yes
Turtle nesting habitat	Unknown	n/a	n/a	21 candidate habitats for Turtle Nesting	n/a	n/a	21 habitats for turtle nesting assumed significant	n/a
Seeps and springs	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a
Amphibian breeding habitat (woodland)	Unknown	n/a	n/a	68 candidate features	None	Turbine, Access Road, Collector Line, Transmission Line (Horizontal Directional Drilling under ah67)	21 Significant Habitats for Amphibian Woodland Breeding	Yes
Amphibian breeding habitat (wetland)	Unknown	n/a	n/a	18 candidate features	None	Turbine, Access Road, Collector Line, Transmission Line (Horizontal Directional Drilling under ah35)	5 Significant Habitats for Amphibian wetland breeding	Yes
SIGNIFICANT WILDILFE HABITAT- ANIMAL MOVEMENT CORRIDORS								
Animal Movement Corridors	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a
SIGNIFICANT WILDILFE HABITAT- SPECIES OF CONSERVATION CONCERN								

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Marsh Bird Breeding Habitat	Unknown	n/a	n/a	Identified presence of 2 candidate significant wildlife habitat features (mbb1 and mbb2)	None	None	None	No
Bird Breeding Habitat (woodland area-sensitive)	Unknown	n/a	n/a	9 woodlands identified as candidate significant wildlife habitat (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194 and wo212)	None	Access Roads, Turbines, Collector Lines	Generalized	Yes
Bird Breeding Habitat (open country)	Unknown	n/a	n/a	None	n/a	n/a	n/a	n/a
Bird Breeding Habitat (shrub/early successional)	Unknown	n/a	n/a	Identified presence of 2 candidate significant wildlife habitat features (sbb1 and sbb2)	None	None	None	No
Terrestrial Crayfish	Unknown	n/a	n/a	None	None	None	n/a	n/a

Table 3.3 Natural Features Tracking

Natural Feature	Record Review Results			Site Investigation			Evaluation of Significance	EIS Completed?
	Feature Identification	Featues within the Project Location	Identified Project Components within 120 m	Results	Features within the Project Location	Confirmed Project Components within 120 m	Results	
Special Concern and Rare Wildlife Species	68 rare vegetation species, 1 amphibian species, 11 birds, 4 reptiles, 9 insects and 4 mammals	Unknown	Unknown	Candidate SWH for 67 rare plant species, Short-eared Owl, Milksnake, Eastern Ribbonsnake, Louisiana Waterthrush, Hooded Warbler, Canada Warbler and Red-headed Woodpecker in and within 120m of the Project Location	None	Access Roads, Turbines, Collector Lines	Habitat for Short-eared Owl, Woodland Vole, Snapping Turtle, Milksnake and Eastern Ribbonsnake	Yes
AREAS OF NATURAL AND SCIENTIFIC INTEREST								
Life Science ANSI	1 provincially significant and 3 regionally significant Life Science ANSIs	None	Collector Line, Access Road, Transmission Line	1 provincially significant and 3 regionally significant Life Science ANSIs	None	Collector Line, Access Road, Transmission Line	1 provincially significant Life Science ANSI	Yes
Earth Science ANSI	1 provincially significant Earth Science ANSI	Collector Line and Access Road	Collector Line and Access Road	1 provincially significant Earth Science ANSI	Collector Line and Access Road (T89)	None	1 provincially significant Earth Science ANSI	Yes
Provincial Park/Conservation Reserve	None	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Specified Provincial Plan Areas	Greenbelt and Niagara Escarpment Lands	Transmission Line	Transmission Line	Greenbelt and Niagara Escarpment Lands	Transmission Line	Transmission Line	Significant	Yes

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
September 1, 2011	Migratory Land Birds	Bob Stamp	7:10 - 9:28	18-22°C with a wind of 2-3; 60-80% cloud cover, no precipitation. Thunder storms in last 24 hours.
September 6, 2011	Migratory Land Birds	Jim Heslop	7:10 - 9:35	13-14°C with a wind of 3-4; 100% cloud cover, light fog/mist. Light rain in last 24 hours.
September 13, 2011	Migratory Land Birds	Bob Stamp	7:15 - 9:20	20-22°C with a wind of 1; 10% cloud cover, no precipitation. Scattered showers in last 24 hours.
September 19, 2011	Migratory Land Birds	Jim Heslop	7:25 - 9:51	13-15°C with a wind of 4; 50-90% cloud cover, no precipitation. No precipitation in last 24 hours.
September 22, 2011	Migratory Land Birds	Peter Read	7:20 - 10:15	16-20°C with a wind of 1; 10-90% cloud cover, no precipitation. Rain in last 24 hours.
September 23, 2011	Ecological Land Classification	M. Ross	Not Recorded	18-20ºC, wind of 2, cloud cover 100%, light to heavy rain; rain within the last 24 hours.
September 27, 2011	Ecological Land Classification	C. Korpijaakko	Not Recorded	20-23ºC, wind of 1, cloud cover 70-95%, no precipitation. No precipitation within the last 24 hours.
September 29, 2011	Migratory Land Birds	Peter Read	7:30 - 10:20	15°C with a wind of 3; 80-95% cloud cover, scattered showers. Rain in last 24 hours.
September 29, 2011	Ecological Land Classification	J. Leslie	10:00-12:30	18ºC, wind of 2, cloud cover 70%, no precipitation. Rain in the last 24 hours.
October 4, 2011	Ecological Land Classification	C. Korpijaakko & N. Leava	Not Recorded	18ºC, wind of 1-2, cloud cover 40-50%, no precipitation. Rain in the last 24 hours.
October 5, 2011	Ecological Land Classification	C. Korpijaakko & N. Leava	Not Recorded	Not Recorded
October 6, 2011	Ecological Land Classification	C. Korpijaakko & N. Leava	Not Recorded	20^0C, wind of 1, cloud cover 0%, no precipitation. No precipitation in the last 24 hours.
October 6, 2011	Migratory Land Birds	Z. Lebrun-Southcott	7:25 - 10:34	8-12°C with a wind of 1; 0% cloud cover, no precipitation. No precipitation in last 24 hours.
October 12, 2011	Migratory Land Birds	Matthew Ross	9:35 - 10:20	17°C with a wind of 2; 100% cloud cover, no precipitation. No precipitation in last 24 hours.
October 12, 2011	Ecological Land Classification	C. Korpijaakko & N. Leava	Not Recorded	14ºC, wind of 1, cloud cover 90-100%, no precipitation; rain within the last 24 hours.
October 13, 2011	Ecological Land Classification	M. Ross, N. Leava & C. Korpijaakko	9:45-4:45	17ºC, wind of 3, cloud cover 90%, no precipitation; rain within the last 24 hours.
October 13, 2011	Migratory Land Birds	Matthew Ross	9:10 - 9:50	16°C with a wind of 2; 100% cloud cover, no precipitation. Rain in last 24 hours.
October 18, 2011	Migratory Land Birds	Melissa Straus	7:28 - 10:15	5-8°C with a wind of 2; 0-10% cloud cover, no precipitation. No precipitation in last 24 hours.
October 24, 2011	Ecological Land Classification	J. Leslie, N. Charlton & C. Payette	15:00-16:30	11ºC, wind of 3, cloud cover 30%, no precipitation. Rain within the last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
October 25, 2011	Ecological Land Classification	N. Charlton	9:00-18:30	10ºC, wind of 2, cloud cover 100%, rain. Rain within the last 24 hours.
October 26, 2011	Ecological Land Classification	N. Charlton & C. Payette	8:00-18:00	10ºC, wind of 2, cloud cover 100%, rain. Rain within the last 24 hours.
October 27, 2011	Ecological Land Classification	N. Charlton	12:00-17:00	10ºC, wind of 1, cloud cover 100%, no precipitation. Rain within the last 24 hours.
October 28, 2011	Ecological Land Classification	N. Charlton	8:00-17:00	10ºC, wind of 1, cloud cover 20%, no precipitation. Rain within the last 24 hours.
November 2, 2011	Ecological Land Classification	C. Payette & N. Charlton	Not Recorded	9-14ºC, wind of 4-5, cloud cover 10-30%, no precipitation. No precipitation within the last 24 hours.
November 3, 2011	Ecological Land Classification	C. Payette & N. Charlton	11:00-17:30	9-12ºC, wind of 0-4, cloud cover 100%, no precipitation. No precipitation within the last 24 hours.
November 4, 2011	Ecological Land Classification	N. Charlton	8:30-13:00	9ºC, wind of 1-2, cloud cover 10%, no precipitation. No precipitation within the last 24 hours.
November 8, 2011	Ecological Land Classification	N. Charlton	10:00-14:00	12ºC, wind of 2, cloud cover 35%, no precipitation. Rain within the last 24 hours.
November 10, 2011	Ecological Land Classification	N. Charlton & C. Payette	15:15-16:00	10^0C, wind of 2, cloud cover 20%, no precipitation. No precipitation in last 24 hours.
November 11, 2011	Ecological Land Classification	N. Charlton	09:00-16:15	5^0C, wind of 2, cloud cover 70%, hail at 15:00. Some precipitation in last 24 hours.
November 15, 2011	Ecological Land Classification	N. Charlton	11:30-16:00	6-12ºC, wind of 1-2, cloud cover 20-90%, no precipitation. Rain within the last 24 hours.
November 16, 2011	Ecological Land Classification	N. Charlton	8:00-16:00	5ºC, wind of 3, cloud cover 100%, no precipitation; rain within the last 24 hours.
November 17, 2011	Winter Raptor Driving Survey	M. Ross & N. Leava	10:30-13:40	8^0C, wind of 3-4, cloud cover 50-70%, no precipitation, no precipitation in last 24 hours.
November 17, 2011	Ecological Land Classification	N. Charlton	9:30-14:30	3ºC, wind of 3, cloud cover 40%, some rain/snow; no precipitation within the last 24 hours.
November 17, 2011	Ecological Land Classification	N. Charlton	Not Recorded	5ºC, wind of 3, cloud cover 90%, no precipitation; rain within the last 24 hours.
November 17, 2011	Winter Raptor Driving Survey	J. Heslop & B. Stamp	10:00-12:30; 14:00-15:00, 15:15-16:00	3^0C, wind of 4, cloud cover 10%, no precipitation, no precipitation in last 24 hours.
November 17, 2011	Short-eared Owl Survey	J. Heslop & B. Stamp	Not Recorded	3^0C, wind of 4, cloud cover 50%, no precipitation, no precipitation in last 24 hours.
November 17, 2011	Short-eared Owl Survey	M. Ross & N. Leava	16:21-17:15	2^0C, wind of 3-4, cloud cover 35%, no precipitation, snow in last 24 hours.
November 17, 2011	Raptor Area Search	J. Heslop & B. Stamp	12:30-14:00	4^0C, wind of 4, cloud cover 15%, no precipitation, no precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
November 17, 2011	Winter Raptor Roost Survey	N. Leava & M. Ross	14:00-15:10	8^{0}C, wind of 3-4 with gusts of 6, periods of light snow, no precipitation in last 24 hours.
November 18, 2011	Ecological Land Classification	N. Charlton	9:00-13:00	0ºC, wind of 3, cloud cover 60%, no precipitation; no precipitation within the last 24 hours.
November 21, 2011	Ecological Land Classification	N. Charlton	10:00-11:00	12ºC, wind of 2, cloud cover 20%, no precipitation; no precipitation within the last 24 hours.
November 28, 2011	Short-eared Owl Survey	B. Holden & Z. Lebrun-Southcott	16:01-17:16	4^{0}C, wind of 2, cloud cover 100%, no precipitation, rain in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Stamp & J. Heslop	12:15-13:00	6^{0}C, wind of 2, cloud cover 80%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Stamp & J. Heslop	11:45-12:15	6^{0}C, wind of 2, cloud cover 100%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Stamp & J. Heslop	13:15-14:30	6^{0}C, wind of 2, cloud cover 100%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Stamp & J. Heslop	14:45-15:45	6^{0}C, wind of 2, cloud cover 100%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Holden & Z. Lebrun-Southcott	11:30-11:42	4^{0}C, wind of 2, cloud cover 90%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Holden & Z. Lebrun-Southcott	11:45-12:54	5^{0}C, wind of 2, cloud cover 80%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Holden & Z. Lebrun-Southcott	13:15-13:52	5^{0}C, wind of 2, cloud cover 100%, no precipitation, some precipitation in last 24 hours.
November 28, 2011	Winter Raptor Roost Survey	B. Holden & Z. Lebrun-Southcott	14:00-14:20	5^{0}C, wind of 2, cloud cover 100%, no precipitation, some precipitation in last 24 hours.
November 29, 2011	Short-eared Owl Survey	B. Stamp & J. Heslop	15:15-17:15	6^{0}C, wind of 4, cloud cover 100%, fog, precipitation in last 24 hours.
November 29, 2011	Short-eared Owl Survey	B. Holden & Z. Lebrun-Southcott	16:15-17:08	4^{0}C, wind of 4, cloud cover 100%, light rain, rain in last 24 hours.
November 29, 2011	Winter Raptor Driving survey	B. Stamp & J. Heslop	9:00-16:00	6^{0}C, wind of 3, cloud cover 100%,some precipitation, some precipitation in last 24 hours.
November 29, 2011	Winter Raptor Driving survey	B. Holden & Z. Lebrun-Southcott	9:58-16:09	5^{0}C, wind of 2-4, cloud cover 100%, rain, rain in last 24 hours.
December 12, 2011	Short-eared Owl Survey	B. Holden & Z. Lebrun-Southcott	15:33-17:12	3^{0}C, wind of 2, cloud cover 0%, no precipitation, no precipitation in last 24 hours.
December 12, 2011	Short-eared Owl Surveys	B. Stamp & J. Heslop	16:00-17:00	3^{0}C, wind of 1, cloud cover 0%, no precipitation, no precipitation in last 24 hours.
December 12, 2011	Winter Raptor Roost Survey	B. Stamp & J. Heslop	10:00-15:15	1^{0}C, wind of 1-2, cloud cover 0%, no precipitation, no precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
December 12, 2011	Winter Raptor Roost Surveys	B. Holden Z. Lebrun-Southcott	10:00-15:00	3^{0}C, wind of 2-3, cloud cover 5%, no precipitation, no precipitation in last 24 hours.
December 13, 2011	Short-eared Owl Survey	B. Holden Z. Lebrun-Southcott	15:33-17:15	4^{0}C, wind of 2-3, cloud cover 60%, no precipitation, no precipitation in last 24 hours.
December 13, 2011	Short-eared Owl Survey	B. Stamp & J. Heslop	16:00-17:00	5^{0}C, wind of 1, cloud cover 80%, no precipitation, no precipitation in last 24 hours.
December 13, 2011	Winter Raptor Driving Survey	B. Stamp & J. Heslop	9:30-16:00	-2^{0}C to 5^{0}C, wind of 2, cloud cover 60%, no precipitation, no precipitation in last 24 hours.
December 13, 2011	Winter Raptor Driving Survey	B. Holden Z. Lebrun-Southcott	8:45-15:00	0^{0}C to 4^{0}C, wind of 2, cloud cover 20-70%, no precipitation, no precipitation in last 24 hours.
January 4, 2012	Short-eared Owl Survey	C. Payette & M. Ross	16:00-17:00	2^{0}C, wind of 4, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
January 4, 2012	Short-eared Owl Survey	N. Leava & B. Holden	16:15-17:15	-1^{0}C, wind of 2, cloud cover 70-100%, no precipitation, light snow in last 24 hours.
January 4, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	8:40-9:30; 10:06-14:38	-1^{0}C, wind of 4, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
January 4, 2012	Winter Raptor Driving Survey	B. Holden & N. Leava	8:56-15:21	-8^{0}C, wind of 2-3, cloud cover 0-100%, no precipitation, no precipitation in last 24 hours.
January 5, 2012	Short-eared Owl Survey	C. Payette & M. Ross	16:07-17:12	2^{0}C, wind of 3, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
January 5, 2012	Short-eared Owl Survey	N. Leava & B. Holden	Not Recorded	0^{0}C, wind of 1-2, cloud cover 50-70%, no precipitation, no precipitation in last 24 hours.
January 5, 2012	Winter Raptor Roost Surveys	M. Ross & C. Payette	9:43-13:38	1^{0}C, wind of 3, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
January 5, 2012	Winter Raptor Roost Surveys	B. Holden & N. Charlton	10:30-14:00	1^{0}C, wind of 3-4, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
January 18, 2012	Short-eared Owl Survey	M. Strauss & N. Leava	16:30-17:40	-6^{0}C, wind of 2, cloud cover 35%, no precipitation, no precipitation in last 24 hours.
January 18, 2012	Short-eared Owl Survey	M. Ross & C. Payette	16:35-17:45	-5^{0}C, wind of 2, cloud cover 20%, no precipitation, light snow in last 24 hours.
January 18, 2012	Winter Raptor Roost Surveys	M. Ross & C. Payette	9:45-13:00	-6^{0}C, wind of 4-5, cloud cover 90-100%, no precipitation, light snow in last 24 hours.
January 18, 2012	Winter Raptor Driving Survey	M. Strauss & N. Leava	9:00 - 16:30	-6^{0}C, wind of 4, cloud cover 80%, no precipitation, rain in last 24 hours.
January 19, 2012	Winter Raptor Roost Survey	N. Leava & M. Strauss	13:30-16:27	-8^{0}C, wind of 5, cloud cover 100%, snow squalls all day - poor visibility, no precipitation in last 24 hours.
January 19, 2012	Short-eared Owl Survey	M. Strauss & N. Leava	16:40-17:50	-8^{0}C, wind of 4, cloud cover 100%,flurries cleared at 16:30, no precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
January 19, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	9:24-12:24; 13:14-15:00	-3^{0}C, wind of 4-5 with gusts to 6, cloud cover 100%, blowing snow late AM to end of survey, no precipitation in last 24 hours.
February 2, 2012	Short-eared Owl Survey	B. Holden & N. Leava	16:55-17:50	1^{0}C, wind of 1-2, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
February 2, 2012	Short-eared Owl Survey	M. Ross & C. Payette	16:45-17:56	1^{0}C, wind of 2, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
February 2, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	9:45-12:38; 14:18-16:06	1^{0}C, wind of 2, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
February 2, 2012	Winter Raptor Driving Survey	B. Holden & N. Leava	10:00-16:33	1^{0}C, wind of 1-2, cloud cover 100%, light flumes, no precipitation in last 24 hours.
February 3, 2012	Short-eared Owl Survey	M. Ross & C. Payette	16:45-17:36	1^{0}C, wind of 2, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
February 3, 2012	Short-eared Owl Survey	B. Holden & N. Leava	16:58-17:50	3^{0}C, wind of 1-3, cloud cover 100%, no precipitation, light flurries in last 24 hours.
February 3, 2012	Winter Raptor Roost Survey	C. Payette & M.Ross	10:10-15:40	1^{0}C, wind of 3-4, cloud cover 90-100%, no precipitation, no precipitation in last 24 hours.
February 3, 2012	Winter Raptor Roost Survey	B. Holden & N. Leava	13:20-14:00	4^{0}C, wind of 2-3, cloud cover 100%, no precipitation, no precipitation in last 24 hours.
February 3, 2012	Winter Raptor Driving Survey	B. Holden & N. Leava	12:00-1:20	5^{0}C, wind of 2, cloud cover 100%, no precipitation, no precipitation in last 24 hours
February 15, 2012	Short-eared Owl Survey	B. Holden & N. Leava	17:15-18:30	3^{0}C, wind of 2, cloud cover 50-90%, no precipiation, no precipitation in last 24 hours
February 15, 2012	Short-eared Owl Survey	M. Ross & C. Payette	17:20-18:16	1^{0}C, wind of 3, cloud cover 65%, no precipiation, no precipitation in last 24 hours
February 15, 2012	Winter Raptor Driving Survey	N. Leava & B. Holden	15:15-13:15	2^{0}C, wind of 1-2, cloud cover 90-100%, no precipitation, flurries in last 24 hours
February 15, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	10:18-13:25	1-3^{0}C, wind of 2, cloud cover 100%, light rain turning to fog, light rain in last 24 hours
February 15, 2012	Winter Raptor Roost Surveys	M. Ross & C. Payette	10:17-13:30	1^{0}C, wind of 2-3, cloud cover 100%, no precipitation, no precipitation in last 24 hours
February 16, 2012	Short-eared Owl Survey	M. Ross & C. Payette	17:14-18:05	3^{0}C, wind of 2-3, cloud cover 100% with fog, drizzle/fog, light rain in last 24 hours
February 29, 2012	Short-eared Owl Survey	B. Holden & N. Leava	17:15-18:20	3^{0}C, wind of 2-3, cloud cover 100%, fog/drizzle, rain in last 24 hours
February 29, 2012	Short-eared Owl Survey	B. Holden & N. Charlton	17:00-18:30	3^{0}C, wind of 2-3, cloud cover 100%, no precipitation, no precipitation in last 24 hours
February 29, 2012	Short-eared Owl Survey	M. Ross & C. Payette	17:35-18:23	3^{0}C, wind of 3, cloud cover 100%, light rain, light rain last 24 hours

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
February 29, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	9:50-12:28; 13:45-15:45	1^{0}C, wind of 3, cloud cover 100%, wet snow turning to rain, light rain/snow in last 24 hours
February 29, 2012	Winter Raptor Driving Survey	B. Holden & N. Charlton	10:36-17:31	1^{0}C, wind of 4-5, cloud cover 100%, wet snow turning to rain, light rain/snow in last 24 hours
March 1, 2012	Winter Raptor Driving Survey	B. Holden & N. Charlton	14:38-15:30	5^{0}C, wind of 3-4, cloud cover 50-100%, no precipitation, rain in last 24 hours
March 1, 2012	Short-eared Owl Survey	M. Ross & C. Payette	17:30-18:28	4^{0}C, wind of 2-3, cloud cover 100%, no precipitation, rain in last 24 hours
March 1, 2012	Short-eared Owl Survey	B. Holden & N. Charlton	17:25-18:35	3^{0}C, wind of 4-5, cloud cover 100%, no precipitation, rain in last 24 hours
March 1, 2012	Winter Raptor Roost Survey	N. Charlton & B. Holden	Not Recorded	6^{0}C, wind of 4-5, cloud cover 70-100%, no precipitation, rain in last 24 hours
March 1, 2012	Winter Raptor Roost Surveys	C. Payette & M. Ross	11:55-13:15	4^{0}C, wind of 3-4, cloud cover 90-100%, no precipitation, rain/sleet in last 24 hours
March 13, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	10:34-15:05; 15:06-17:25	15^{0}C, wind of 3-4, cloud cover 0-40%, no precipitation, rain in last 24 hours
March 13, 2012	Winter Raptor Driving Survey	B. Holden & D. Graham	10:30-15:35	15^{0}C, wind of 2, cloud cover 10%, no precipitation. Rain in last 24 hours.
March 13, 2012	Short-eared Owl Survey	B. Holden & D. Graham	18:45-19:55	12^{0}C, wind of 3, cloud cover 0%, no precipitation, rain in last 24 hours
March 13, 2012	Short-eared Owl Survey	C. Payette & M.Ross	18:50-19:35	12^{0}C, wind of 3, cloud cover 35%, no precipitation, rain in last 24 hours
March 13, 2012	Access-road site investigation with Hatch (inlcuding sheet water/spring flooding observations)	N. Charlton & S.Muscat	9:00-5:00	12-24^{0}C, wind of 2, cloud cover 20-100%, heavy precipitation (thunder storm) on March 14 at approximately 10:00-11:00am in the morning, otherwise no precipitation. No precipitation in last 24 hours.
March 14, 2012	Short-eared Owl Survey	C. Payette & M.Ross	18:45-19:55	14^{0}C, wind of 1, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
March 14, 2012	Winter Raptor Roost Surveys	C. Payette & M.Ross	16:00-17:03	16^{0}C, wind of 3, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
March 14, 2012	Winter Raptor Roost Survey	B. Holden D. Graham	Not Recorded	18^{0}C, wind of 2-3, cloud cover 0%, no precipitation, no precipitation in last 24 hours.
March 14, 2012	Winter Raptor Driving Survey	D. Graham & B. Holden	12:45-x	15^{0}C, wind of 1, cloud cover 0%, no precipitation, no precipitation in last 24 hours.
March 14, 2012	Access-road site investigation with Hatch (inlcuding sheet water/spring flooding observations)	N. Charlton & S.Muscat	9:00-5:00	Not Recorded
March 15, 2012	Winter Raptor Driving Survey	M. Ross & C. Payette	10:34-15:05; 15:06-17:25	15^{0}C, wind of 3-4, cloud cover 0-40%, no precipitation, rain in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
March 15, 2012	Access-road site investigation with Hatch (inlcuding sheet water/spring flooding observations)	N. Charlton & S.Muscat	9:00-5:00	Not Recorded
March 16, 2012	Access-road site investigation with Hatch (inlcuding sheet water/spring flooding observations)	N. Charlton & S.Muscat	9:00-5:00	Not Recorded
March 21, 2012	Access-road site investigation with Hatch (inlcuding sheet water/spring flooding observations)	N. Charlton & S.Muscat	9:00-5:00	Not Recorded
March 22, 2012	Access-road site investigation (inlcuding sheet water/spring flooding observations)	N. Charlton & S.Muscat	9:00-5:00	12-24^{0}C, wind of 2, cloud cover 20-30%, no precipiation
April 7, 2012	Amphibian Call Counts Round 1	B. Holdon	20:15-23:55	4-9^{0}C, wind of 0-1, no cloud cover, no precipiation. No precipitation in last hours.
April 8, 2012	Amphibian Call Counts Round 1	B. Holdon	20:20-23:00	7-8^{0}C, wind of 3-4, cloud cover 50%, no precipiation. No precipitation in last 24 hours.
April 9, 2012	Migratory Bird	B. Stamp & J. Heslop	7:00 - 9:35	2°C to 5°C with a wind of 4; 0-5% cloud cover, no precipitation. No precipitation in last 24 hours.
April 9, 2012	Amphibian Call Counts Round 1	B. Holdon	20:00-23:45	4-8^{0}C, wind of 3-4, cloud cover 30-50%, no precipiation. No precipitation in last 24 hours.
April 12, 2012	Amphibian Call Counts Round 1	B. Holdon	20:00-00:45	8^{0}C, wind of 3-5, cloud cover 20%, no precipiation. Light rain within last 24 hours.
April 13, 2012	Migratory Bird	B. Stamp & J. Heslop	6:50 - 10:40	- 3°C to 9°C with a wind of 0; no cloud cover, no precipitation. No precipitation in last 24 hours.
April 17, 2012	Migratory Bird	M. Ross & K. Walpole	7:08 - 10:40	5°C to 8°C with a wind of 2-4; 15-25% cloud cover, no precipitation. No precipitation in last 24 hours.
April 17, 2012	Amphibian Call Counts Round 1	B. Holdon	20:30-21:10	2-5^{0}C, wind of 3, no cloud cover, no precipiation. No precipitation in last 24 hours.
April 19, 2012	Migratory Bird	M. Ross & K. Walpole	6:55 - 10:30	7°C to 13°C with a wind of 0-5; 15-70% cloud cover, no precipitation. No precipitation in last 24 hours.
April 20, 2012	Amphibian Call Counts Round 1	B. Holdon	20:00-00:20	8-15^{0}C, wind of 4-5, cloud cover 100%, no precipiation. No precipitation in last 24 hours.
April 20, 2012	Ecological Land Classification	S. Spisani	14:30-15:45	Not Recorded
April 21, 2012	Amphibian Call Counts Round 1	B. Holdon	20:30-00:00	5-8^{0}C, wind of 3-4, cloud cover 100%, no precipiation. Rain in last 24 hours.
April 22, 2012	Amphibian Call Counts Round 1	B. Holdon	20:40-00:00	5-8^{0}C, wind of 3-4, cloud cover 80%, no precipiation. No precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
April 25, 2012	Amphibian Call Counts Round 1	B. Holdon	20:20-00:00	6-10^{0}C, wind of 1-2, cloud cover 40-90%, no precipiation. Rain in last 24 hours.
April 26, 2012	Migrtory Bird	M. Ross & K. Walpole	6:30 - 10:00	4°C to 11°C with a wind of 0-2; 60-100% cloud cover, no precipitation. No precipitation in last 24 hours.
April 27, 2012	Amphibian Call Counts Round 1	B. Holdon	20:30-00:20	5-10^{0}C, wind of 3, cloud cover 30%, no precipiation. Rain in last 24 hours.
April 29, 2012	Amphibian Call Counts Round 1	N. Charlton & N. Leava	20:48-23:20	8^{0}C, wind of 0-1, cloud cover 20%, no precipiation. No precipitation in last 24 hours.
May 1, 2012	Migratory Bird	B. Stamp	6:30 - 10:20	8°C to 10°C with a wind of 0-2; 100% cloud cover, no precipitation. Rain within last 24 hours.
May 2, 2012	Migratory Bird	D. Graham	6:20 - 9:30	10°C to 12°C with a wind of 0-1; 100% cloud cover, no precipitation. No precipitation in last 24 hours.
May 6, 2012	Migratory Bird	J. Heslop	6:15 - 10:15	5°C to 9°C with a wind of 0-2; 5-10% cloud cover, no precipitation. No precipitation in last 24 hours.
May 7, 2012	Migratory Bird	M. Ross	6:18 - 10:20	10°C to 16°C with a wind of 3; 60-100% cloud cover, no precipitation. Light rain in last 24 hours.
May 8, 2012	Migratory Bird	J. Heslop	6:10 - 10:00	10°C to 12°C with a wind of 0; 100% cloud cover, 2mm precipitation. 2mm of rain in last 24 hours.
May 9, 2012	Amphibian Call Counts Round 2	M. Straus & N.Leava	20:35-23:05	12-13^{0}C, wind of 3, cloud cover 50-100%, no precipiation. Thunder storm in last 24 hours.
May 10, 2012	Migrtory Bird	M. Straus	6:15 - 10:00	8°C to 10°C, wind of 2; 75-100% cloud cover, light rain. Light rain in last 24 hours.
May 14, 2012	Amphibian Call Counts Round 2	M. Straus & N.Leava	20:30-23:30	17^{0}C, wind of 1, cloud cover 25%, no precipiation. No precipitation in last 24 hours.
May 14, 2012	Amphibian Call Counts Round 2	K. Walpole D. Graham	20:58-23:40	17^{0}C, wind of 2, cloud cover 10%, no precipiation. No precipitation in last 24 hours.
May 16, 2012	Migratory Bird	M. Straus	5:45 - 10:00	14°C to 16°C with a wind of 0-1; 35-60% cloud cover, no precipitation. No precipitation in last 24 hours.
May 17, 2012	Amphibian Call Counts Round 2	J. Leslie & N. Leava	21:00-23:00	13^{0}C, wind of 0, no cloud cover, no precipiation. No precipitation in last 24 hours.
May 17, 2012	Amphibian Call Counts Round 2	C. Payette & D. Graham	20:55-23:42	17^{0}C, wind of 2, 10% cloud cover, no precipiation. No precipitation in last 24 hours.
May 18, 2012	Migratory Bird	K. Walpole	6:32 - 10:10	13°C to 18°C with a wind of 0-2; 5-15% cloud cover, no precipitation. No precipitation in last 24 hours.
May 22, 2012	Amphibian Call Counts Round 2	B. Holden	22:00-00:55	13-17^{0}C, wind of 3, cloud cover 80-100%, no precipiation. Rain in last 24 hours.
May 23, 2012	Amphibian Call Counts Round 2	C. Payette &K. Walpole	21:58-23:58	18^{0}C, wind of 1, cloud cover 10%, no precipiation. No precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
May 23, 2012	Amphibian Call Counts Round 2	M. Straus & N.Leava	21:00-23:30	19^{0}C, wind of 1, no cloud cover, no precipiation. No precipitation in last 24 hours.
May 23, 2012	Amphibian Call Counts Round 2	B. Holden	21:00-00:30	17-23^{0}C, wind of 1-2, cloud cover 50%, no precipiation. No precipitation in last 24 hours.
May 23, 2012	Ecological Land Classification	L. Robson	12:09-13:03	Not Recorded
May 23, 2012	Ecological Land Classification	C. Payette	Not Recorded	23-24^{0}C, wind of 2-3, cloud cover 10-40%, no precipiation. Light rain in last 24 hours.
May 24, 2012	Amphibian Call Counts Round 2	C. Payette & L. Robson	20:57-22:10	19^{0}C, wind of 1, 15% cloud cover, no precipiation. No precipitation in last 24 hours.
May 24, 2012	Migratory Bird	B. Holden	5:51 - 9:39	18°C to 24°C with a wind of 2-3; 70% cloud cover, no precipitation. No precipitation in last 24 hours.
May 24, 2012	Amphibian Call Counts Round 2	B. Holden	21:00-00:00	25^{0}C, wind of 2, cloud cover 20-50%, no precipiation. No precipitation in last 24 hours.
May 24, 2012	Amphibian Call Counts Round 2	N. Charlton & K. Walpole	21:00-X	25^{0}C, cloud cover 50%, no precipiation. No precipitation in last 24 hours.
May 24, 2012	Ecological Land Classification	C. Payette & L. Robson	Not Recorded	26-31^{0}C, wind of 1-3, cloud cover 0%, no precipiation. No precipitation in last 24 hours.
May 24, 2012	Ecological Land Classification	L. Robson	Not Recorded	27^{0}C, wind of 4, cloud cover <10%, no precipiation. No precipitation in last 24 hours.
May 24, 2012	Ecological Land Classification	N. Charlton & K.Walpole	10:30-18:00	32^{0}C, wind of 0-1, cloud cover 10%, no precipiation. No precipitation in last 24 hours.
May 25, 2012	Migratory Bird	B. Holden	6:02 - 10:19	18°C to 21°C with a wind of 2; 30-60% cloud cover, no precipitation. No precipitation in last 24 hours..
May 25, 2012	Ecological Land Classification	N. Charlton	12:30-16:30	25-30^{0}C, wind of 1-4, cloud cover 40-60%, no precipiation. No precipitation in last 24 hours.
May 25, 2012	Ecological Land Classification	L. Robson	Not recorded	25^{0}C, wind of 4-5, cloud cover 20-70%, no precipiation. No precipitation in last 24 hours.
May 26, 2012	Amphibian Call Counts Round 2	B. Holden	21:00-00:15	22-26^{0}C, wind of 2-3, cloud cover 30-80%, no precipiation. No precipitation in last 24 hours.
May 29, 2012	Ecological Land Classification	M. Ross	Not Recorded	29^{0}C, wind of 5-6, cloud cover 75-90% with haze, no precipiation. No precipitation in last 24 hours.
May 30, 2012	Ecological Land Classification	S. Spisani	Not Recorded	Not Recorded
May 30, 2012	Ecological Land Classification	D. Graham	14:00-19:40	Not Recorded
May 30, 2012	Ecological Land Classification	M. Ross	Not Recorded	21^{0}C, wind of 3-5, cloud cover 15-70%, no precipiation. No precipitation in last 24 hours.
May 30, 2012	Amphibian Call Counts Round 2	M. Straus & N.Leava	21:15-23:15	16^{0}C, wind of 0-1, cloud cover 0-30%, no precipiation. No precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
May 30, 2012	Amphibian Call Counts Round 2	J. Leslie & H. Huges	21:20-23:30	15^{0}C, wind of 2, cloud cover 50%, no precipiation. No precipitation in last 24 hours.
May 31, 2012	Ecological Land Classification	M. Ross	Not Recorded	16-19^{0}C, wind of 3, cloud cover 80%, no precipiation. No precipitation in last 24 hours.
May 31, 2012	Ecological Land Classification	S. Spisani	Not Recorded	Not Recorded
May 31, 2012	Breeding Bird Survey Round 1	B. Stamp	05:42-09:50	10-14^{0}C, wind of 0-1, cloud cover 20-80%, no precipitation. No precipitation in last 24 hours.
May 31, 2012	Breeding Bird Survey Round 1	J. Heslop	05:35-10:00	10-14^{0}C, wind of 0-1, cloud cover 10-40%, no precipitation. No precipitation in last 24 hours.
June 2, 2012	Breeding Bird Survey Round 1	B. Stamp	05:50-10:00	10-11^{0}C, wind of 2, cloud cover 100%, no precipitation. Rain in last 24 hours.
June 2, 2012	Breeding Bird Survey Round 1	J. Heslop	06:00-9:30	11^{0}C, wind of 2, cloud cover 100%, no precipitation. Rain in last 24 hours.
June 4, 2012	Ecological Land Classification	J. Leslie	10:55-18:46	16-18^{0}C, wind of 2, cloud cover 50-100%, no precipiation. Light precipitation in last 24 hours.
June 5, 2012	Ecological Land Classification	J. Leslie	9:00-15:47	20^{0}C, wind of 2, cloud cover 0%, no precipiation. No precipitation in last 24 hours.
June 5, 2012	Ecological Land Classification	N. Leava	9:30-10:30	20^{0}C, wind of 0-2, cloud cover 0-25%, no precipiation. Light precipitation in last 24 hours.
June 5, 2012	American Badger Survey	N. Leava	15:30	25^{0}C, wind of 1, cloud cover 60%, no precipiation. Rain in last 24 hours.
June 5, 2012	Bat Maternity Roost Habitat Assessment	N. Leava	Not Recorded	20^{0}C, wind of 0-2, cloud cover 0-25%, no precipitation. Rain in last 24 hours.
June 5, 2012	Bat Maternity Roost Habitat Assessment	N. Leava	Not Recorded	20^{0}C, wind of 0-2, cloud cover 0-25%, no precipitation. Rain in last 24 hours.
June 5, 2012	Bat Maternity Roost Habitat Assessment	N. Leava	Not Recorded	20^{0}C, wind of 0-2, cloud cover 60%, no precipitation. Rain in last 24 hours.
June 6, 2012	Ecological Land Classification	A. Ducharme	9:30-18:00	23^{0}C, wind of 15-30km/h, cloud cover is cloudy, light precipiation on June 6 at approximately 17:00-18:00 at night, otherwise no precipitation during the day. Light rain in last 24 hours.
June 6, 2012	Ecological Land Classification	N. Leava	Not Recorded	22-25^{0}C, wind of 0-3, cloud cover 0-75%, no precipiation. No precipitation in last 24 hours.
June 6, 2012	Bat Maternity Roost Habitat Assessment	N. Leava	Not Recorded	20^{0}C, wind of 0-2, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
June 8, 2012	Ecological Land Classification	J. Leslie	11:00-19:08	25^{0}C, wind of 2-3, cloud cover 50%, no precipiation. Light precipitation in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
June 8, 2012	Ecological Land Classification	N. Charlton	11:45-17:00	25^{0}C, wind of 2, cloud cover 50-70%, no precipiation. No precipitation in last 24 hours.
June 8, 2012	Ecological Land Classification	N. Leava	Not Recorded	25^{0}C, wind of 0-2, cloud cover 50%, no precipiation. Thunder storm in last 24 hours.
June 8, 2012	Ecological Land Classification	C. Payette	Not Recorded	29-32^{0}C, wind of 2-4, cloud cover 0-40%, no precipiation. No precipitation in last 24 hours.
June 8, 2012	Amphibian Call Counts Round 3	J. Leslie & N. Charlton	21:00-23:06	17^{0}C, wind of 2-3, cloud cover 60%, no precipiation. Rain in last 24 hours.
June 8, 2012	Blanding's Turtle Survey	Not recorded	18:30-20:50	Not Recorded
June 11, 2012	Ecological Land Classification	J. Leslie	8:30-17:26	Not Recorded
June 11, 2012	Amphibian Call Counts Round 3	J. Leslie & N. Charlton	21:00-22:44	20^{0}C, wind of 3, cloud cover 100%, light rain. Light rain in last 24 hours.
June 11, 2012	Amphibian Call Counts Round 3	N. Leava & A. McCreery	21:00-22:35	18^{0}C, wind of 0-2, cloud cover 100%, light rain. No precipitation in last 24 hours.
June 11, 2012	Blanding's Turtle Survey	N. Leava & A. McCreery	18:30-20:32	18^{0}C, wind of 0-1, cloud cover 100%, intermittent rain. No precipitation in last 24 hours.
June 11, 2012	Blanding's Turtle Survey	N. Charlton	18:30-20:00	19^{0}C, wind of 1, cloud cover 100%, light rain. No precipitation in last 24 hours.
June 12, 2012	Amphibian Call Counts Round 3	Not recorded	21:15-23:42	19^{0}C, wind of 2-3, cloud cover 5%, no precipiation. Rain in last 24 hours.
June 13, 2012	Amphibian Call Counts Round 3	B. Holden	21:20-23-55	15-20^{0}C, wind of 0-2, cloud cover 5%, no precipitation. No precipitation in last 24 hours.
June 13, 2012	Blanding's Turtle Survey	B. Holden	18:30-20:33	23^{0}C, wind of 0-1, cloud cover 5-15%, no precipitation. No precipitation in last 24 hours.
June 14, 2012	Amphibian Call Counts Round 3	J. Leslie	21:15-23:33	18^{0}C, wind of 1-2, cloud cover 10%, no precipitation. No precipitation in last 24 hours.
June 14, 2012	Amphibian Call Counts Round 3	B. Holden	21:00-01:00	15-18^{0}C, wind of 1-2, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
June 14, 2012	Breeding Bird Survey Round 2	B. Stamp	05:20-09:04	10-16^{0}C, no wind, cloud cover 20-40%, no precipitation. Thunder storms in last 24 hours.
June 14, 2012	Breeding Bird Survey Round 2	J. Heslop	06:00-09:00	10-16^{0}C, no wind, cloud cover 20-40%, no precipitation. No precipitation in last 24 hours.
June 15, 2012	Breeding Bird Survey Round 2	J. Heslop	05:45-09:35	12-15^{0}C, no wind, cloud cover 0-5%, no precipitation. No precipitation in last 24 hours.
June 15, 2012	Breeding Bird Survey Round 2	B. Stamp	05:38-08:30	12-18^{0}C, no wind, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
June 18, 2012	Amphibian Call Counts Round 3	N. Leava & A. McCreery	21:00-23:45	20^{0}C, wind of 0-2, cloud cover 50-70%, no precipitation. Rain in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
June 19, 2012	Amphibian Call Counts Round 3	H. Hughes & K. Walpole	21:29-00:03	30^{0}C, wind of 1, cloud cover 15%, no precipitation. Rain in last 24 hours.
June 19, 2012	Blanding's Turtle Survey	H. Hughes & K. Walpole	18:40	30^{0}C, wind of 1, cloud cover 15%, no precipiation. Rain in last 24 hours.
June 21, 2012	Amphibian Call Counts Round 3	N. Leava &K. Walpole	21:00-23:00	26^{0}C, wind of 4, cloud cover 50-100%, light rain. Heavy rain / light rain in last 24 hours.
June 21, 2012	Stick Nest Search	K. Walpole & N. Leava	20:15-20:44	28^{0}C, wind of 3-4, cloud cover 50-100%, light rain. No precipitation in last 24 hours.
June 22, 2012	Amphibian Call Counts Round 3	H. Hughes & K. Walpole	21:11-23:45	15^{0}C, wind of 0, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
June 22, 2012	Ecological Land Classification (Roadside)	C. Payette	Not Recorded	22-25^{0}C, wind of 3, cloud cover 10-50%, no precipitation. Rain in last 24 hours.
June 25, 2012	Amphibian Call Counts Round 3	J. Leslie & N. Charlton	21:35-23:53	18^{0}C, wind of 3-4, cloud cover 40%, no precipitation. No precipitation in last 24 hours.
June 26, 2012	Amphibian Call Counts Round 3	H. Hughes & N. Charlton	16:35-23:35	20^{0}C, wind of 0, cloud cover 5%, no precipitation. No precipitation in last 24 hours.
June 26, 2012	Ecological Land Classification (Roadside)	A. Ducharme	08:30-17:00	20-25^{0}C, wind of 0-1, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
June 27, 2012	Amphibian Call Counts Round 3	N. Charlton	21:33-23:16	Not recorded
June 27, 2012	Ecological Land Classification (Roadside)	A. Ducharme	08:30-18:00	20-25^{0}C, wind of 0-1, partly cloudy, light rain. 1-3mm of rain in last 24 hours.
June 28, 2012	Amphibian Call Counts Round 3	N. Charlton & M. Churchill	21:30-22:45	30^{0}C, wind of 2, cloud cover 90%, no precipitation. No precipitation in last 24 hours.
June 28, 2012	Breeding Bird Survey Round 3	B. Stamp	05:40-09:30	19-26^{0}C, wind of 0-1, cloud cover 0-100%, no precipitation. Rain in last 24 hours.
June 28, 2012	Breeding Bird Survey Round 3	J. Heslop	06:00-09:03	18-21^{0}C, no wind, cloud cover 30-80%, no precipitation. No precipitation in last 24 hours.
June 28, 2012	Ecological Land Classification (Roadside)	C. Payette	11:05-14:45	33^{0}C, wind of 3-4, cloud cover 0%, no precipitation. No precipitation in last 24 hours.
June 29, 2012	Breeding Bird Survey Round 3	B. Stamp	05:45-08:56	20-24^{0}C, wind of 0-1, cloud cover 5-40%, no precipitation. No precipitation in last 24 hours.
June 29, 2012	Breeding Bird Survey Round 3	J. Heslop	06:02-09:00	18-20^{0}C, wind of 0-1, cloud cover 5-10%, no precipitation. No precipitation in last 24 hours.
June 29, 2012	Ecological Land Classification (Roadside)	C. Payette	Not Recorded	27-30^{0}C, wind of 3, cloud cover 10-70%, no precipitation. No precipitation in last 24 hours.
July 3, 2012	Ecological Land Classification (Roadside)	A. Ducharme	08:30-18:00	25^{0}C, wind of 0-1, partly cloudy, no precipitation. <1mm of rain in last 24 hours.

Table 4.1 Site Investigation Summary

Survey Date	Survey Type	Completed By	Time	Weather Conditions*
July 4, 2012	Ecological Land Classification (Roadside)	K. St. James	09:44-15:00	25-35^{0}C, wind of 3, cloud cover 30-100%, no precipitation. Heavy rain in last 24 hours.
July 5, 2012	Ecological Land Classification (Roadside)	M. Ross	10:27-12:00	28^{0}C, wind of 3, cloud cover 50%, hazy at times, no precipitation. No precipitation in last 24 hours.
July 12, 2012	Ecological Land Classification (Roadside)	C. Payette	Not Recorded	32^{0}C, wind of 3, cloud cover 10-20%, no precipitation. No precipitation in last 24 hours.
July 13, 2012	Ecological Land Classification (Roadside)	C. Payette	Not Recorded	29-33^{0}C, wind of 3, cloud cover 10%, no precipitation. No precipitation in last 24 hours.
July 27, 2012	Bat Maternity Roost Habitat Assessment	N. Charlton	Not Recorded	25^{0}C, wind of 3, cloud cover 50%, no precipitation. Rain in last 24 hours.
July 27, 2012	Ecological Land Classification (Roadside)	N. Charlton	10:10-11:20	25^{0}C, wind of 3, cloud cover 50%, no precipitation. Rain in last 24 hours.
August 15, 2012	Ecological Land Classification (Roadside)	N. Charlton & A. Orr	9:40-14:00	20^{0}C, wind of 2, cloud cover 35%, no precipitation. No precipitation in last 24 hours.
August 15, 2012	Ecological Land Classification	C. Payette	10:00-17:00	26^{0}C, wind of 2, cloud cover 20%, no precipitation. No precipitation in last 24 hours.
August 27, 2012	Ecological Land Classification (Roadside)	C. Payette	11:50-15:25	22^{0}C, wind of 3, 100% cloud cover 100%, heavy rain. Rain in last 24 hours.
August 27, 2012	Ecological Land Classification (Roadside)	M. Ross	Not Recorded	25^{0}C, wind of 3-4, 100% cloud cover 100%, rain. No precipitation in last 24 hours.
August 27, 2012	Ecological Land Classification (Roadside)	K. St. James	8:45-15:50	27^{0}C, wind of 2, 100% cloud cover 100%, rain. Rain in last 24 hours.
September 7, 2012	Ecological Land Classification (Roadside)	B. Miller	11:52-13:33	26^{0}C, wind of 2, 100% cloud cover 50%, rain. No precipitation in last 24 hours.
October 18, 2012	Ecological Land Classification (Roadside)	C. Payette	9:30-16:30	15^{0}C, wind of 3-4, 10% cloud cover, very heavy rain occurred at one point during the day, otherwise clear. No precipitation in last 24 hours.
October 19, 2012	Ecological Land Classification (Roadside)	C. Payette	9:30-15:00	8^{0}C, wind of 3, 10% cloud cover, no precipitation. Rain in last 24 hours.

Table 4.2 Summary of Corrections to Records Review

Features wthin 120m of the Project Location	Records Review Results	Corrections made as a result of site investigation	Report Section Providing Criteria Used in Determination of Correction
Wetlands	154 wetlands in 16 provincially significant wetland (PSW) complexes and 4 locally significant wetland (LSW) complexes identified within 120m of the Project Location and 9 in the Project Location	88 PSW features in 16 identified Provincially Significant Wetland Complexes within 120m of the Project Location.	4.2.2.1
		Site investigations confirmed that corrections were required to the boundaries of 10 wetland features (we97, we229, we349, we332, we303, we299, we440, we458, we467, we522)	
		5 locally significant wetland features in 4 locally significant wetland complexes.	4.2.2.2
	803 pockets of unevaluated wetland identified within 120 m of the Project Location and 13 wetlands in the Project Location	64 unevaluated wetland features within 120m of the Project Location and no wetlands within the Project Location.	4.2.2.3
Woodlands	265 woodlands identified within 120m of the Project Location and 12 woodlands in the Project Location	215 woodland features identified within 120m of the Project Location	4.2.3
Wildlife Habitat: Seasonal Concentration Areas	118 Deer Winter Congregation areas identified in and within 120m of the Project Location.	Site investigations confirmed that corrections were required to the boundaries of 112 of the deer winter congregation areas	4.2.5.1
	Potential for Landbird Migratory Stopover Areas	5 habitats identified (mlsa1-mlsa5)	
	Potential for wintering raptors	7 habitats identified (w1 - wr7)	
	Potential for snake hibernacula	6 habitats identified (sh2 - sh7)	

Table 4.2 Summary of Corrections to Records Review

Features wthin 120m of the Project Location	Records Review Results	Corrections made as a result of site investigation	Report Section Providing Criteria Used in Determination of Correction
Wildlife Habitat: Specialized Habitats	Potential for Rare Vegetation Communities	8 habitats identified (CL01, TAT1-7* and rv1, rv2, rv3, rv4, rv6 and rv7)	4.2.5.2
	Potential for woodland raptor nesting habitat	9 habitats identified (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194, wo212)	
	Potential for turtle nesting habitat	21 habitats identified	
	Potential for breeding amphibians	68 woodland habitats identified	
		18 wetland habitat features identified	
Wildlife Habitat: Species of Conservation Concern	Potential Marsh Bird Breeding Habitat	2 habitats identified (mbb1 and mbb2)	4.2.5.3
	Potential for woodland area-sensitive breeding birds	9 habitats identified (wo62, wo69, wo97, wo142, wo150, wo178, wo180, wo194, wo212)	
	Potential for rare and declining species	7 habitats identified for Short-eared owl (wr1- wr7)	
		21 habitats identified for Snapping Turtle	
		Generalized habitat identified for Woodland Vole	
		6 habitats identified for Milksnake (sh2 - sh7)	
		6 habitats identified for Eastern Ribbonsnake (sh2- sh7)	
Animal Movement Corridors	Potential Amphibian corridors	5 amphibian corridors identified	4.2.5.4

Table 4.3 ELC Overview

ELC Type	Community Description
Cliff (CL)	
Open Cliff (CLO)	
CLO1 Carbonate Open Cliff Ecosite	This community generally runs in a north-south direction between the TAT1-7* and the FOD5-8 in the Mountainvew Conservation Area. The height of the cliff varied from 3m to 10m across its length and was primarily covered with moss and herbaceous species. Some smaller areas where the cliff face has undergone more fracturing had a higher predominance of shrubs and younger trees. The dominant species were grasses, celandine, garlic mustard and herb-robert. The most commonly observed woody species were red raspberry, grape vine, and young American basswood. A portion of the Bruce Trail crosses this community.
Talus (TA)	
Treed Talus (TAT)	
TAT1-7* Fresh-Moist Black Maple Carbonate Treed Talus	The dominant canopy species in this community was mature black maple, followed by smaller proportions of American basswood and ash species. The generally open understory consisted of spicebush and red-berried elderberry. The ground layer was dominated by blue-cohosh, Goldie's fern, and herb-robert. Other commonly encountered species included Virginia waterleaf, grasses, zig-zag goldenrod, and wild ginger. The substrate is dominated by coarse rocky debris and thin soils, with more accumulating in deeper crevices. No detailed soil sampling could be carried out due to the nature of the substrate. A portion of the Bruce Trail crosses through this community.
Forest (FO)	
Deciduous Forest (FOD)	
FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.
FOD (B) Deciduous Forest	This community was not visible from the road and could not be surveyed. The western edge of this feature occurs within the 120m survey area.
FOD/SWD Deciduous Forest with Deciduous Swamp Inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.
FOD1 Dry-Fresh Oak Deciduous Forest Ecosite	The canopy consists of a mixture of species such as Trembling aspen, sugar maple, red, white and bur oak, American elm and Freeman's maple were found consistently throughout this community.
FOD1-1 Dry-Fresh Red Oak Deciduous Forest Type	This community contained red oak, white ash and American beech located within the canopy cover. Ground cover was dominated by large-leaved aster.
FOD2 Dry – Fresh oak – Maple – Hickory Deciduous Forest	Shagbark hickory, red oak, and sugar maple were canopy species present. The understory consisted mainly of gray dogwood and tree saplings. Ground vegetation was dense and composed of garlic mustard, goldenrod, and white avens, with fewer occurrences of cleavers, inserted Virginia creeper, and enchanter's nightshade, among others.
FOD2-2 Dry-Fresh Oak-Hickory Deciduous Forest	The canopy of this community consists of shagbark hickory with red oak and bur oak. The understorey of this community is consists of hawthorn species with chokecherry and saplings of red oak and green ash. The ground cover is dominated by orchard grass with smooth brome, lesser stitchwort and wild madder.
FOD2-2/FOD7-2 dry-fresh oak-hickory deciduous forest complex with fresh-moist lowland ash deciduous forest	bur oak, red oak and white oak dominated this community in a variable mixture. Shagbark hickory and sugar maple were also present and were the dominant component of the understory. Ground cover included species of Goldenrod.
FOD2-2/SWD2-2 Dry-Fresh Oak-Hickory Deciduous Forest Complex with Green Ash Mineral Decidous Forest	Red oak was the dominant canopy cover in this communitiy, with Bur oak, green ash and shagbark hickory associates. The subcanopy included red oak, green ash and shagbark hickory, with an understory dominated by green ash, white elm and shagbark hickory saplings. Ground cover was not observed in this community.
FOD2-4 Dry – Fresh Oak-Hardwood Deciduous Forest	The canopy consisted primarily of white oak, red oak, bur oak, black walnut and sugar maple. American beech, red oakand sugar maple made the understory layer, while grasses, goldenrod, and raspberries dominated the ground vegetation.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD2-4 Dry-Fresh Oak-Hardwood Deciduous Forest	The canopy in this community consisted of American basswood, Black oak, Sugar maple and Shagbark hickory. The sub-canopy included Ash species, Sugar maple, White elm, American basswood and Black oak, with sparse Manitoba maple. The understory was comprised of White elm, American basswood and Sugar maple, while the ground layer consisted of Aster species, New England aster and Tall goldenrod, with Panicled aster, Virginia creeper, grasses, goldenrod, raspberry species and Riverbank grape.
FOD3-1 Dry to Fresh Poplar Deciduous Forest	Canopy species occurring in this community included Cottonwood species, Trembling aspen, White Ash, Green Ash, Willow species, Sugar maple, American basswood and Red oak . The sub-canopy included Sugar maple, Trembling aspen and Cottonwood species. The understory was comprised of species such as Staghorn sumac, Spicebush, Sugar maple, Trembling aspen, virginia creeper and Gray dogwood, while the ground layer contained Currant species, Spicebush, Tall goldenrod, Canada goldenrod, Wood nettle, Poison Ivy and Sensitive fern.
FOD3-1/MAM2-11* Dry-Fresh Poplar Deciduous Forest with Foxtail Mineral Meadow Marsh Inclusion	This forest community has canopy cover of aspen, maple, elm, ash and birch species. A meadow marsh inclusion dominated by foxtail grasses was located within this deciduous forest community.
FOD4 Dry-fresh Deciduous forest	Dominated by Bur oak and American Beech along with other unidentifiable deciduous species.
FOD4-1 Dry – Fresh Beech Deciduous Forest	The canopy consisted of American beech, red oak, white elm and White ash. The ground vegetation was dominated by grass species, goldenrod, riverbank grape and wild red raspberry.
FOD4-2 Dry-fresh white ash deciduous forest	This community was dominated by white ash in the canopy and subcanopy, other associates included red oak, white oak and trembling aspen. Understory vegation included riverbank grape, the ground layer was not visible during the survey.
FOD4-4* Dry – Fresh Black Walnut Deciduous Forest	This community was located on an adjacent property and assessed from the edge. The most abundant canopy species was black walnut, with much lower abundances of Scotch pine and bur oak. The understory consisted mainly of gray dogwood. Ground vegetation could not be seen from the survey point.
FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite	Sugar maple, red oak, large-tooth aspen and hemlock comprised the canopy species. The sub-canopy contained primarily sugar maple, hop hornbeam and American beech. The understory consisted of sugar maple and american beech saplings, with less frequent occurrences of wild red raspberry and Millspaugh's blackberry, while the ground vegetation contained species such as sugar maple, panicled aster, avens, Large-leaved aster, enchanter's nightshade, jack-in-the-pulpit and thimble berry.
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest Type	The canopy species in this community included sugar maple, with american basswood, green ash, red maple, American elm and black cherry associates. The Sub-canopy consisted of sugar maple, while the understory contained sugar maple and black cherry. The ground layer consisted of species such as zig-zag goldenrod, aster species and grasses.
FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.
FOD5-2/SWD2-2 Dry-Fresh Sugar Maple-Beech Deciduous forest with a Green Ash Mineral Deciduous Swamp complex	The canopy of this community is comprised predominately of Sugar maple, American Beech, with lesser components of Red oak and American basswood, while both the sub-canopy and understory primarily consisted of American beech, Sugar maple and Hop hornbeam. The ground cover consisted of Sedge species, Avens species and Christmas fern. A complex of Green Ash Mineral Deciduous Swamp is associated with the above community due to the presence of low-lying areas containing hydrophilic species and some pools of water.
FOD5-2/SWD3-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest Type	The most abundant canopy species in this community were American Beech and Sugar Maple with some black cherry and yellow birch. The understory consisted primarily of young sugar Maple and American beech with ironwood and black cherry also present. Jack in the pulpit and riverbank grape was the dominant ground vegetation, followed by Canada mayflower and trillium.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD5-2/MAM2-10 Dry – Fresh Sugar Maple – Beech Deciduous Forest with an inclusion of Forb Mineral Meadow Marsh	The canopy comprised a dense cover of sugar maple with American beech, white oak, and bur oak. The sub-canopy consisted of sugar maple with American beech and hop hornbeam. The ground vegetation was made up primarily of aster species, zig-zag goldenrod and goldenrod species. There was a small inclusion of forb mineral meadow marsh within the community.
FOD5-2/MAM2-2 Dry – Fresh Sugar Maple – Beech Deciduous Forest With an inclusion of Reed-canary Grass Mineral Meadow Marsh	The canopy consisted of dense cover of sugar maple, American beech, shagbark hickory, and red oak. The sub-canopy was made up of American beech, hop hornbeam, sugar maple, and blue beech. The ground cover consisted mostly of zig-zag goldenrod, grass species, and goldenrod species. There was a small reed-canary grass mineral meadow marsh inclusion within the above community.
FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.
FOD5-3/SWD2-2 Dry – Fresh Sugar Maple – Oak Deciduous Forest with a Green Ash Mineral Swamp Inclusion	The canopy was fairly mixed, with shagbark hickory, red oak, sugar maple, white oak, and black cherry dominating. The understory was dominated by wild red raspberry and smaller proportions of hawthorn. Garlic mustard and goldenrod were the most abundant species in the ground layer. There was a small inclusion of green ash mineral deciduous swamp.
FOD5-4 Dry-Fresh Sugar Maple-Ironwood Deciduous Forest	The canopy in this forest is composed of sugar maple, red oak, bur oak and shagbark hickory. The sub-canopy is dominated by ironwood with very few white elm occuring close to feature edge. Understory vegetation is comprised of white ash and blue beech with rarely witchhazel. the ground layer was sparse, consisting of mainly grasses and young trees. Community likely disturbed by grazing in the past.
FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous Forest	The most abundant canopy species in this community included Sugar maple, White ash, Red oak and American basswood. The sub-canopy consisted of species such as Sugar maple, American basswood, White ash, Chinquapin oak and Red oak. Species in the understory included Spicebush, Sugar maple, Common hop tree and White Ash, while the ground layer consisted of Herb robert, goldenrods, Enchanter's nightshade, Solomon's seal species, Blue cohosh, sedge species and Sensitive fern.
FOD5-9 Dry-Fresh Sugar Maple-Red Maple Deciduous Forest	The canopy of this community consisted of Sugar maple and Red maple in roughly equal proportions, with some Red oak and White birch. The sub-canopy included Sugar maple and Red maple, with Shagbark hickory and Red oak. The understory contained Blue beech and American beech with less common occurrences of American elm and White birch.
FOD5-10 Dry – Fresh Sugar Maple – White Birch – Poplar Deciduous Forest	The most abundant canopy species in this forest was sugar maple, followed by less frequent occurrences of eastern cottonwood, and rare occurrences of several other species such as green ash, paper birch, and black cherry. The subcanopy consisted mainly of sugar maple, with trembling aspen, and scattered blue beech. Spicebush, raspberry, hawthorn and maple-leaved viburnum were common understory species, while the ground layer consisted of species such as Virginia creeper, large-leaved aster, reed canary grass, goldenrod species and false solomon's seal. Occasionaly present were depressional areas where Swamp maple was more abundant in the canopy.
FOD5-11* Fresh-Moist Sugar Maple-Oak-Beech Deciduous Forest	The most abundant canopy species in this community were sugar maple and white oak with American beech. The understory consisted of sugar maple, long-spined hawthorn, American beech and white oak. Sugar maple saplings were the most abundant ground vegetation along with red raspberry and poison ivy.
FOD6 Fresh – Moist Sugar Maple Deciduous Forest	The canopy consisted of sugar maple, red oak, and shagbark hickory. Occasional black walnut and green ash were also present. Ground vegetation observed at the edge of the forest included ox-eye daisies, goldenrod, and bird's foot trefoil. These species are not indicative of the interior of the community.
FOD6/SWD Fresh-Moist Sugar Maple deciduous forest with SWD inclusion	Canopy species noted include sugar maple, white elm, green ash, basswood and Red oak. The understory included Virginia creeper and poison ivy. With ground vegetation including sensitive fern, horsetail, may apple and several species of ferns. An inclusion of Deciduous swamp likely occurs within the community based on air photo interpretation.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD6-1 Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest Type	The canopy species found in this community included sugar maple, white ash, red oak and Scots pine. Sub-canopy species present included Sugar maple, American beech, American basswood and hop hornbeam. The understory consisted of poison ivy, wild red raspberry, Virginia creeper and a currant/gooseberry species. The ground layer contained species such as Garlic mustard, wood nettle, aster species, goldenrod species, red raspberry, sedge species and spotted touch-me-not.
FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.
FOD6-5/MAM2-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with an inclusion of Reed-canary Grass Mineral Meadow Marsh	The most abundant canopy species in this community were shagbark hickory, swamp maple, red oak, and sugar maple. The understory consisted primarily of wild red raspberry, blue beech and hawthorn. A strawberry species was the most abundant ground vegetation species visible, followed by poison ivy and mayapple, and there were fewer occurrences of wood nettle and sedges.
FOD6-5/MAS2-10*/SWT2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with an inclusion of Barnyard Grass Mineral Shallow Marsh and a complex of Buttonbush Mineral Swamp Thicket	The dominant canopy species were sugar maple, red oak, and shagbark hickory, and there was a sub-canopy consisting of sugar maple, hop hornbeam, American beech, and blue beech. There was no evident understory shrub layer. The ground vegetation consisted primarily of sugar maple, blackberry species, and large-leaved aster. The community contained an inclusion of shallow marsh dominated by a barnyard grass species. There was also a complex of buttonbush mineral thicket swamp, confined mostly to the southeastern half of the community.
FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	Dominant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.
FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The dominant canopy species were sugar maple, red oak, and American beech, while the sub-canopy contained sugar maple, hop hornbeam and American beech. The understory consisted mostly of saplings of sugar maple and hop hornbeam. Panicled aster, avens, and raspberry species made up the ground layer. Complexed within this were a few small pockets of red maple mineral swamp.
FOD6-5/SWD2-2/MAS2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp and Broad-leaved Sedge Shallow Marsh	Dominant species were red and white oak with sugar maple. The sub-canopy consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. Complexed within this community were two wetland communities – green ash mineral deciduous swamp and broad-leaved sedge shallow marsh. Most of the swamp pockets had pools of water and abundant emergent vegetation.
FOD6-5/MAS2-4/SWT Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Broad-leaved Sedge mineral Shallow Marsh and Thicket Swamp	The dominant canopy species were sugar maple and red oak with a smaller amount of white pine. Hop hornbeam, American beech, black cherry and blue beech dominated the sub-canopy. The understory consisted mainly of American beech, blue beech, and a rose species. Large-leaf aster, blackberry species, and rough goldenrod dominated the ground vegetation. There was a complex of broad-leaved sedge shallow marsh and a thicket swamp occupying lower ground throughout the community.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	The canopy consisted of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated the ground layer. There was a swamp maple swamp complex within the community.
FOD7 Fresh – Moist Lowland Deciduous Forest	Canopy species consisted of swamp maple, paper birch and eastern cottonwood, with swamp maple, green ash, black cherry, and paper birch in the sub canopy. Spicebush and gray dogwood formed the larger part of the understory, while green ash, enchanter's nightshade, and Virginia creeper made up the ground vegetation.
FOD7-1 Fresh – Moist White Elm Lowland Deciduous Forest	White elm and green ash were the most abundant canopy species, with less frequent occurrences of red maple and trembling aspen. The sub-canopy contained species such as white elm and green ash, The understory consisted of gray dogwood, narrow-leaved meadowsweet, elderberry and wild red raspberry. Rough goldenrod, touch-me-not species, sedges, and sensitive fern made were common species in the ground cover.
FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.
FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	The canopy in this community was dominated by Green ash, with Red maple and sparse White elm and Trembling aspen. Green ash and White elm were the most abundant species in the sub-canopy, with infrequent occurrences of Red maple and Trembling aspen. The understory included Green ash, White elm, Staghorn sumac and Nannyberry, while the ground layer was largely Sensitive fern with Canada and Tall goldenrods and Raspberry species. An inclusion of a Cattail Mineral Shallow Marsh was identified within the above community.
FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest with a Broad – Leaved Sedge Meadow Marsh inclusion and a Dry – Moist Old Field Meadow Complex	The canopy included Green Ash, Eastern Cottonwood and Trembling Aspen, while the understory contained Riverbank Grape, Gray Dogwood, Speckled Alder and Hawthorn species. The ground layer was largely comprised of Goldenrod species, Reed-canary grass and Common Milkweed.
FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	This community is dominated by willow trees in the canopy and is associated with riparian zones and creeks throughout the study area.
FOD7-4 Fresh-Moist Lowland Black Walnut Deciduous Forest	Dominated entirely by black walnut in the canopy.
FOD7-4/FOD6 Fresh-moist Black Walnut Lowland Deciduous Forest complex with Fresh-Moist Sugar Maple Deciduous Forest	This Community occurred on a gentle slope, with Sugar maple occurring higher on the slope, and lower slopes almost entirely dominated by black walnut.
FOD7-6* Fresh-Moist Ash-Silver Maple Lowland Deciduous Forest	The canopy of this community consisted of White ash and Silver maple in approximately equal proportions with some Black walnut, manitoba maple and sparse occurrences of Hop hornbeam. The sub-canopy included mainly Silver maple, with Hop hornbeam, White ash and Sugar maple occurring in equal proportions. The understory was comprised of Gray and Red osier dogwoods, Spicebush and Hop hornbeam, while the ground layer included Currant species, Canada goldenrod, Riverbank grape and Aster species.
FOD7-7* Fresh-Moist Maple-Elm Lowland Deciduous Forest	The canopy of this community was comprised of Silver maple, Black ash, Red oak and White elm. The sub-canopy contained Silver maple, White elm, Black ash and Red maple, while the understory was dominated by Spicebush. The ground layer was sparse and included Grass species, Royal fern and Enchanter's nightshade.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD7-8* Fresh-Moist Swamp-Red Maple Lowland Deciduous Forest	This forest community had a canopy which was dominated by Freeman's maple, with components of Red maple, Black cherry and Black ash. The sub-canopy also largely consisted of Freeman's maple, with fewer occurrences of Red maple, Black cherry and Black ash. The understory included mainly Spicebush, with some Red maple and Black cherry, while the ground layer consisted of Sensitive fern, Spicebush and Spinulose wood fern. Some surface water occurred along the border of this community adjacent to the Black ash mineral deciduous swamp (SWD2-1). This community contained a clay-loam soil with an organics layer of <1cm and a moisture regime of 4. Depth to bedrock was >120cm.
FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.
FOD8-3* Fresh to moist Eastern Cottonwood Deciduous Forest	This small community is dominated by Eastern cottonwood in the canopy, with trembling aspen and white elm associates. The sub-canopy was dominated by staghorn sumac, riverbank grape also occurred. The ground layer included species of goldenrods and burdock.
FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest	The canopy consisted of species such as shagbark hickory, sugar maple, white oak, bur oak, red oak, and American basswood. The understory, consisted of sugar maple, shagbark hickory, bur oak, and white ash, with black locust and staghorn sumac. The ground layer was composed of sedges, with white avens, large-leaved avens, and creeping cinquefoil.
FOD9/SWD Fresh – Moist Oak – Maple – Hickory Deciduous Forest with a Deciduous Swamp Complex	This community was assessed from the edge, but it appeared to be a complex of FOD and SWD, with the swamp containing swamp maple and oak species. Canopy species in the forest consisted of sugar maple, shagbark hickory, swamp maple, and swamp oak. The understory was primarily made up of gray dogwood with lower abundances of choke cherry and nannyberry. Goldenrod, scarlet strawberry and garlic mustard were the most abundant species in the ground layer.
FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.
FOD9-1/SWD2-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Green Ash Mineral Deciduous Swamp complex	This community had a canopy comprised predominately of Sugar maple, Red oak and White oak. The sub-canopy consisted of mainly Sugar maple with some White ash, Hop hornbeam, Red oak and American beech. The understory contained mostly Sugar maple and American beech, while the ground cover consisted of Large-leaved aster, Sedge species and Goldenrod species. A deciduous swamp is Complexed throughout this community as there were numerous low-lying areas containing hydrophilic species (Highbush blueberry, Winterberry) and some pools.
FOD9-1/SWD2-2/MAS2-4 Fresh – Moist Oak – Sugar Maple Deciduous Forest with a Green Ash Swamp complex and inclusion of Broad-leaved Sedge Mineral Shallow Marsh	Dominant canopy species were red and white oak with sugar maple and ash species. Smaller components of red maple and swamp white oak were also present and primarily occupied a transition zone between the forest and swamp communities. The sub-canopy consisted of sugar maple with a much smaller proportion of hop hornbeam and American beech. The understory appeared to consist exclusively of sugar maple, and the dominant ground layer species were wild red raspberry and avens. A green ash swamp was complexed within the community as well as a broad-leaved sedge shallow marsh.
FOD9-1/SWD3-1/MAS2-4 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Red Maple Mineral Deciduous Swamp and Broad-leaved Sedge Mineral Shallow Marsh complex	This community had a canopy of Sugar maple, Red oak, White pine and Ash species. The sub-canopy contained Sugar maple, Hop hornbeam, Red oak and White oak. The understory consisted of Sugar maple, American Beech, Hop hornbeam and Blue beech, while the ground layer included Millspaugh's blackberry, Pennsylvania sedge, Maple-leaved viburnum and Wild red raspberry. Areas of Red Maple Deciduous Swamp and Broad-leaved sedge Shallow Marsh were found throughout the forest community and included as a complex.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD9-1/SWT2-4/SWD1-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Buttonbush Mineral Thicket Swamp inclusion and a Bur Oak Mineral Deciduous Swamp complex	This community had a canopy consisting of White oak, Red oak, Sugar maple and White pine. The sub-canopy contained Hop hornbeam, Blue beech and White pine, while the understory consisted largely of Black cherry, Blue beech, Hop hornbeam and White pine. The ground layer included Sedge species, Large-leaved aster and Millspaugh's blackberry. A Buttonbush Mineral Thicket Swamp occurred within this community and was added as an inclusion. The primary species here included Eastern buttonbush, Winterberry, Red-osier dogwood and Narrow-leaved meadow sweet. Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well.
FOD9-1/SWT2-4 Fresh – Moist Oak - Sugar Maple Deciduous Forest with an inclusion of Buttonbush Mineral Thicket Swamp	Sugar maple, red oak, and shagbark hickory dominated the canopy; hop hornbeam, American basswood, American elm, and black cherry made up the sub-canopy. The understory consisted primarily of bitternut hickory and black cherry, while blackberry species, panicled aster, and garlic mustard predominated in the ground layer. The community contained a small inclusion of buttonbush mineral thicket swamp.
FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species.
FOD9-2/SWD1-2 Fresh – Moist Oak – Maple Deciduous Forest with a complex of Bur Oak Mineral Deciduous Swamp	The canopy contained red oak, white oak, sugar maple and red maple as dominants. Red oak, sugar maple, American beech, and white oak made up the sub-canopy. The understory consisted of blue beech, American beech, sugar maple and hop hornbeam, while sedges, goldenrod, large-leaved aster and avens made up the ground layer. Complexed within this forest was a bur oak mineral deciduous swamp. Some portions of the swamp complex were more dominated by red maple or green ash with some younger oaks in lower proportions.
FOD9-2/MAM2-12* Fresh-Moist Oak-Maple Deciduous Forest with a Common Reed Mineral Meadow Marsh inclusion	This community had a canopy consisting of Red oak, Red maple and Green ash, with few Black cherry and Willow species. The sub-canopy also contained Red oak and Red maple with sparse occurrence of Black cherry and Green ash. The understory included mainly spicebush, with American beech and Currant species, while the ground layer was comprised of Calico aster, Canada goldenrod, Reed-canary grass and Riverbank grape. A Common reed meadow marsh inclusion was identified within the above community.
FOD9-2/SWD1-1/SWT2-2 Fresh-Moist Oak – Maple Deciduous Forest With complexes of Swamp White Oak Deciduous Swamp and Buttonbush Mineral Thicket Swamp	The dominant canopy species were red maple, red oak and white oak, followed by smaller components of sugar maple, shagbark hickory, and green ash. Blue beech and red maple dominated the sub-canopy and understory. Other frequently observed understory species were raspberries and viburnums. The ground layer was dominated by rough goldenrod, large-leaved aster, and sedges.
FOD9-3 /FOD7-2 Fresh-Moist Bur oak Deciduous forest complex with fresh-moist lowland ash deciduous forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.
FOD9-4 Shagbark Hickory Deciduous Forest	The edge of this deciduous forest was inventoried from Walker Road. The canopy and sub-canopy are dominated by Shagbark Hickory. Bur Oak is abundant in the sub-canopy and occasional in the understory. Gray Dogwood, Hawthorn and Prickly Ash are abundant at the outer edge of the forest. The ground layer of this forest community was not visible due to the thick understory shrubs at the edge of the forest.
FOD9-6* Fresh-Moist Hickory-Ash-Oak-Elm Deciduous Forest Type	This community was assessed from the property line due to restricted property access. This community was composed of shagbark hickory, green ash, bur oak and American elm.
FOD9-6*/SWD2-2 Fresh-Moist Mixed Deciduous Forest with a Green Ash Mineral Deciduous Swamp complex	This forest community had a canopy consisting of Red oak, Shagbark hickory, Green ash and Sugar maple. The sub-canopy contained Hop hornbeam, White elm, Shagbark hickory and American basswood. The understory included Hop hornbeam, White elm, Sugar maple and Black cherry, while the ground layer was comprised of Raspberry species, Goldenrod species and Sedge species. A complex of Green Ash deciduous swamp was present throughout the forest community.

Table 4.3 ELC Overview

ELC Type	Community Description
FOD9-7* Red Oak-Basswood Deciduous Forest	Canopy cover was relatively open in this community and was dominated by red oak and basswood with some sugar maple. The understory consisted primarily of raspberry species, hawthorn and gray dogwood. Red raspberry, goldenrod and grasses were the dominant ground vegetation.
Coniferous Forest (FOC)	
FOC2-2 Dry-Fresh White Cedar Coniferous Forest	This community was dominated by Eastern white cedar with some instances of white pine in the canopy. Ground vegetation was absent.
Mixed Forest (FOM)	
FOM Mixed Forest	This community has a variety of species mixed throughout the canopy cover, with greater than 25% of both coniferous and decidious species composition.
FOM2-2 Dry to fresh white pine-sugar maple mixed forest	Freeman's maple is the dominant canopy cover in this community, Eastern cottonwood, sugar maple and white pine are common associates. Subacanopy species include trembling aspen and norway spruce, The understory is sparse and includes white spruce and staghorn sumac. Ground cover is dominated by goldenrod species and rivrbank grape.
FOM8-1 Fresh-moist Poplar mixed forest	Trembling aspen dominated this community with some scots pine as an associate. Understory vegation included staghorn sumac and riverbank grape. Ground cover was not identifiable.
Cultural (CU)	
Cultural Plantation (CUP)	
CUP Cultural Plantation	This community results from, or maintained by, cultural or anthropogenic-based distubances.
CUP1-1 Sugar maple Deciduous Plantation	This community is dominated by sugar maple, ground cover has been mown and is unidentifiable.
CUP1-3 Black Walnut Deciduous Plantation	This plantation was dominated by mature black walnut, with rarely occurring sugar maple in the canopy. Ground cover was obstructed by residences.
CUP1-5 Silver Maple Deciduous Plantation	This was a small roadside community included within an Old Field Meadow Community. The community consisted of an even-aged stand of mid-age silver maple and a ground layer of primarily orchard grass and some scattered goldenrods.
CUP2-2*/MAM2-2/CUM1-1 White Pine-Mixed Coniferous Plantation with a Reed canary Grass Mineral Meadow Marsh and Dry-moist Old Field Meadow complex	This community had a canopy consisting largely of White pine, with Red oak, Elm species, Tamarack and Freeman's maple. The ground layer included Grass species, Goldenrod species and New England aster. Reed-canary grass meadow marsh and Old Field meadow communities were identified as complexed with the above community.
CUP3 Coniferous Plantation	The dominant canopy species was young to mid-age spruce trees with a much smaller component of young sugar maple trees scattered throughout. Since it was a young community, canopy cover was more open than is typically seen in coniferous plantations. Ground vegetation was profuse and was dominated by short grasses with occasional occurrences of panicled asters and new-england asters throughout.
CUP3-1 Red pine Coniferous plantation	This community included a plantation of red pine which was unmaintained, other species present included white spruce, white pine and green ash.
CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.
CUP3-2/CUM1-1/SWT2-6 White Pine Coniferous Plantation with a complex of Dry-Moist Old Field Meadow and Meadowsweet Mineral Thicket Swamp	The dominant tree species throughout was white pine; this was intermixed with a ground layer typical of old field meadow, consisting of grasses, tall goldenrod, flat-topped bushy goldenrod, and asters. There was also a high proportion of wetter meadow species such as rushes. There were several meadowsweet mineral thicket swamps distributed throughout.
CUP3-3 Scotch pine cultural plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.
CUP3-8 White Spruce-European Larch Coniferous plantation	This plantation community was dominated by white spruce.

Table 4.3 ELC Overview

ELC Type	Community Description
CUP 3-3/CUM1-1 Scotch Pine Coniferous Plantation with a complex of Dry-Moist Old Field Meadow	The canopy consisted primarily of Scotch pine, with much lower occurrences of white spruce and paper birch. The understory was made up of gray dogwood, common buckthorn, and wild red raspberry. The ground layer consisted of equal proportions of forbs and graminioids, and included such species as Kentucky bluegrass, orchard grass, goldenrods, scarlet strawberry, black medic, dandelion, and wild carrot.
CUP3-12* Spruce Coniferous Plantation	This community consisted of various planted spruce species.
CUP1-4 Hybrid Poplar Deciduous Plantation Type	This community is heavily influenced or maintained by cultural or anthropogenic-based disturbances. This cultural plantation is composed predominantly of hybrid poplar species.
Cultural Meadow (CUM)	
CUM1-1 Dry-Moist Old field cultural meadow	This community consisted of several forbs and grasses in varying composition and dominance including Goldenrod species, ox-ey daisy, wild teasel, wild carrot, tufted vetch, reed canary grass, Awnless brome, Scarlet strawberry, Knapweed, Kentucky bluegrass
CUM1-1/MAM2-2 Dry-Moist Old field cultural meadow with a Reed-canary Grass Mineral Meadow Marsh inclusion	This community included mainly Grass species, New England aster and Goldenrod species, with less abundance of Wild carrot, Sedge species, Tufted vetch and Sweet-clover species. The Cultural Meadow is bordered by an inclusion of Reed-canary Grass Meadow Marsh.
CUM1-1/MAM1-5 Dry – Moist Old Field Meadow with an inclusion of Graminioid Mineral Meadow Marsh	Species observed were typical of other dry-moist old field communities in the study area, with goldenrods, asters, and grasses dominating.
Cultural Thicket (CUT)	
CUT1 Dry-Moist Old Field Cultural Meadow	The canopy layer consisted of sparse occurrences of Green Ash, American Elm, Eastern Cottonwood and Apple species. The understory included Dogwood species, Staghorn Sumac, Raspberry species, and Riverbank grape. The ground layer was comprised mainly of Reed canary grass, Goldenrod species and Wild carrot.
CUT1-1/CUM1-1 Sumac Cultural Thicket with Dry-Moist Old Field Meadow Inclusion	A shrub community dominated by staghorn sumac, surrounded by a cultural meadow, supported by various species of grasses, goldenrods and asters. This complex community is a result from, or maintained by, cultural or anthropogenic-based distubances.
CUT1-1 Sumac Cultural Thicket	The dominant canopy species was staghorn sumac, with young American elm, trembling aspen, and red oak making up a smaller component. The understory was dominated by red-panicled dogwood and wild red raspberry, and the ground layer was made up of goldenrods, teasel and reed-canary grass.
CUT1-4 Gray Dogwood Cultural Thicket	The canopy of this community type occasionally contained sparse occurrences of species such as Manitoba Maple, Bur Oak, White oak, Red maple, White Ash and American Elm. The understory of this community was comprised largely of Gray dogwood, with Hawthorn species, Narrow-leaved meadowsweet, staghorn sumac, and Rose species. The ground layer included Grass species, New England aster, Oxeye daisy, Riverbank grape and wild carrot.
CUT1-7* Red Osier Dogwood Cultural Thicket	The sub-canopy layer occasionally contained species such as Spicebush, while the understory was comprised of Canada goldenrod, Tall white aster, Spicebush and Red osier dogwood. Species occurring less frequently included staghorn sumac, American elm, Bitternut Hickory and Red Raspberry. Tall white aster was also a ground layer component.
CUT1-8* Hawthorn Cultural Thicket	The canopy and sub-canopy layers were dominated by hawthorn. Other species in the canopy were apple species and white elm, and there was a smaller amount of dogwood in the sub-canopy. The ground layer was made up primarily of species such as garlic mustard and avens.
CUT1-9*Tartarian honeysuckle Cultural Thicket	Dominated by Tartarian honeysuckle in the understory layer, with some gray dogwood. The ground layer is dominated by Canada goldenrod, grasses and riverbank grape.
CUT1-10* Common buckthorn-Hwathorn Cultural Thicket	This community occurs in an old pasture community. The canopy includes rare green ash and sugar maple, with an understory dominated by common buckthorn and hawthorn, with ocassional gray dogwood. The ground layer is dominated by grass species, with goldenrod species and new england aster.

Table 4.3 ELC Overview

ELC Type	Community Description
Cultural Savannah (CUS)	
CUS1-4* Ash Cultural Savannah	This young community with approximately 30% tree cover is dominated by green ash in the canopy with bur oak and white spruce associates. The ground layer was dominated by grasses, goldenrods and common milkweed.
Cultural Woodland (CUW)	
CUW Cultural Woodland	This community results from, or maintained by, cultural or anthropogenic-based distubances.
CUW1 Mineral Cultural Woodland	The average height of trees in this community was 6 to 8 m and the most abundant species were swamp maple, green ash and trembling aspen. There was a dense understory of gray dogwood, swamp maple, and narrow-leaved meadowsweet, and a ground layer of Kentucky bluegrass, creeping cinquefoil, scarlet strawberry, and goldenrod.
CUW1-3* Manitoba Maple Cultural Woodland Type	This community had a canopy consisting of Manitoba maple, white ash, Scots pine and white elm. The understory layer was made up of staghorn sumac, black raspberry and Virginia creeper, while the ground layer consisted of spotted touch-me-not, poison ivy, wood nettle and garlic mustard.
CUW1-3*/MAM2-6 Manitoba Maple Cultural Woodland with a Broad-leaved Sedge Mineral Meadow Marsh inclusion	The canopy of this community consisted of Cottonwood species, with the sub-canopy containing both Cottonwood and Freeman's maple. The understory included Freeman's maple as well as Canada goldenrod, Tall white aster, Common boneset. Evidence of past clearing was observed and this community appears to be the result of regeneration. A broad-leaved sedge meadow marsh occurred as an inclusion within the woodland community. The cultural woodland contained a clay-loam soil with an organics layer of 22.8cm in depth and a moisture regime of 4-5. Depth to bedrock was >120cm.
CUW1-5* White Elm Cultural Woodland	The sparse canopy of this woodland is dominated by American elm followed by black cherry, white ash and a hawthorn species. The understorey of this woodland is dense and dominated by grey dogwood and wild red raspberry followed by Tartarian honeysuckle and chokecherry. Ground cover is dominated by Kentucky blue grass followed by Canada goldenrod.
CUW1-6* Black Walnut Cultural woodland type	This culturally influenced community was dominated by black walnut in the canopy with lower proportions of scots pine, sugar maple and Manitoba maple. The understory consisted of young black cherry, black walnut and lower proportions of Manitoba maple. Grasses were the dominant ground cover within the community with red raspberry, garlic mustard and goldenrods also present.
CUW1-7*/MAM2-6 Freeman Maple Cultural Woodland with a Broad-leaved Sedge Mineral Meadow Marsh inclusion	The canopy of this community consisted of Cottonwood species, with the sub-canopy containing both Cottonwood and Freeman's maple. The understory included Freeman's maple as well as Canada goldenrod, Tall white aster, Common boneset. A broad-leaved sedge meadow marsh occurred as an inclusion within the woodland community.
CUW1-8* Maple - Walnut cultural woodland type	This cultural community located north of highway 3was assessed from the roadside and was dominated by red maple and black walnut with green ash also present in the canopy. The dominant understory vegetation included red maple, basswood and black walnut. Ground cover within the community was dominated by grasses
CUW1-10* Ash Cultural Woodland	The canopy was made up primarily of white ash, bitternut hickory, and american basswood. American ash, hawthorn species, and black walnut formed the dense sub canopy and understory layers. The ground vegetation consisted of goldenrod, knapweed and grasses.
CUW1-11* Green Ash Cultural Woodland	The most abundant canopy and subcanopy species in this woodland consisted of green ash and eastern cottonwood, with fewer occurrences of white elm and scotch pine. The understory was dense and included primarily green ash, tartarian honeysuckle, and staghorn sumac. Goldenrod, grasses including reed canary grass, and wild carrot were the most abundant ground layer species.
CUW1-12* Green Ash-Freeman's Maple Cultural Woodland Type	Planted deciduous woodland adjacent to the residence. Rows of only green ash and Freeman's maple, with a high grass ground layer of orchard grass and soft brome.
CUW 1-13* Black Walnut – green ash cultural woodland	The most abundant canopy species in this cultural woodland were black walnut, sugar maple and green ash. The understory was made up of gray dogwood, red raspberry, chokecherry and tartarian honeysuckle, and the ground vegetation consisted of grasses, damesrocket, cattails, wild teasel, garlic mustard and white avens.

Table 4.3 ELC Overview

ELC Type	Community Description
CUW 1-14* Scots Pine Cultural Woodland	This community was a cultural Scots pine planation with some Eastern cottonwood contributing to the canopy. The sub canopy was made up of white elm and Manitoba maple. The understory consisted of silky dogwood and grey dogwood with some common buckthorn and nannyberry present. The ground vegetation consisted mostly of virginia creeper, wild red raspberry, poison ivy and spotted touch-me-nots. It was noted that many of the Scots pines were unhealthy and dying with several snags present.
CUW1-15* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.
CUW1-16* Bur oak Mineral Cultural Woodland	This community is dominated by bur oak in the canopy with black walnut and bur oak in the sub canopy, ground cover includes teasel, goldenrods and grasses.
CUW1-17* Bur oak-Shagbark hickory Cultural woodland	This community is dominated by Bur oak and shagbark hickory in the canopy, with gray dogwood in the understory. Ground cover is dominated by goldenrods and grasses.
CUW1-18* American Elm-Green ash Cultural Woodland	This community is dominated by American elm and green ash in the canopy. Understory vegation includes Gray dogwood and apple species. The ground layer is dominated by common milkweed, oxeye daisy and goldenrod species.
CUW1-19* Silver maple Cultural Woodland	This community is heavyly managed and adjacent to a residence which has mown along the edges of the community. Dominant species in the canopy include silver maple with bur oak and white elm associates. Understorey vegetation includes riverbank grape and gray dogwood. The ground layer included Reed canary grass, other grass species and goldenrod species.
CUW1-20* Poplar Cultural woodland	Eastern cottonwood and trembling aspen dominate in this young community in both the canopy and the understory. Associates of white birch and staghorn sumac are also present. The ground layer is dominated by goldenrods, queen anne's lace and common milkweed.
Swamp (SW)	
Mixed Swamp (SWM)	
SWM2 Maple Mineral Mixed Swamp	The canopy was dominated by eastern hemlock, yellow birch, and red and Freeman's maple. The sub-canopy was made up of eastern hemlock, red and Freeman's maple, and hop hornbeam. Eastern hemlock again dominated the understory along with yellow birch, red maple, and Freeman's maple, while royal fern, cinnamon fern and sedges made up the ground layer.
SWM2-2 Swamp Maple – Conifer Mixed Swamp	The canopy was dominated by eastern hemlock and Freeman's maple, with a smaller component of white pine. The sub-canopy consisted of hop hornbeam, witch-hazel, and yellow birch. Winterberry and eastern buttonbush were the most abundant understory species, while the ground layer consisted of royal fern, cinnamon fern, and bitter nightshade.
Deciduous Swamp (SWD)	
SWD Deciduous Swamp	Assessed from the roadside, this swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access
SWD/CUW Deciduous Swamp with Cultural Woodland Inclusion	This community is predominantly a deciduous swamp, with a small portion (less than 0.5ha) of a cultural woodland, dominated by deciduous tree cover.
SWD/FOD Deciduous Swamp with Deciduous Forest Inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.
SWD1-1 Swamp White Oak Deciduous Swamp	The canopy was dominated by swamp white oak, with less common occurrences of red maple, red oak and green ash. The understory consisted of species such as narrow-leaved meadowsweet and red-panicled dogwood. Reed-canary grass, sensitive fern, blue flag iris and wild red raspberry were species occurring in the ground layer.
SWD1-2/MAM2-2 Bur Oak Mineral Deciduous Swamp with a Reed Canary Grass Mineral Meadow Marsh inclusion	This community had a canopy consisting of Swamp White oak, Bur oak and Freeman's maple in similar proportions, with fewer occurrences of Shagbark hickory. The sub-canopy contained White elm, Freeman's maple and Shagbark hickory, while the understory was comprised of Freeman's maple and dogwood species in similar proportions, with a few Highbush blueberry and Winterberry. Ground cover species included Panicled aster, Reed canary grass, Sedge species and Moneywort. A Reed canary grass Mineral Meadow Marsh was considered an inclusion to the swamp community due to the abundance of Reed canary grass.

Table 4.3 ELC Overview

ELC Type	Community Description
SWD1-2/SWT2-9 Bur Oak Mineral Deciduous Swamp with an inclusion of Gray Dogwood Mineral Thicket Swamp	Bur oak dominated the canopy, while reed-canary grass and goldenrod dominated the ground layer. There was also an inclusion of gray dogwood mineral thicket swamp.
SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
SWD2-2/MAM2-6 Green ash mineral	The most abundant canopy species in this swamp were green ash, trembling aspen, and bur oak. The understory was made up of narrow-leaved meadowsweet and white elderberry, and the
SWD2-2/SWT2-4 Green Ash Mineral Deciduous Swamp with Buttonbush Mineral Thicket Swamp Inclusion	This community was dominated by green ash in the canopy with lower proportions of swamp white oak, freeman's maple and white elm. The understory consisted of raspberry species, dogwood species and narrow-leaved meadowsweet. Jewelweed was the dominant ground cover within the community with sedge species also present. The Inclusion was dominated by eastern buttonbush with some narrow-leaved meadowsweet and winterberry present.
SWD2-2/SWT2 Green Ash Mineral Deciduous Swamp/Mineral Thicket Swamp	Green ash was the dominant canopy cover in the treed portion of this community, white spruce and eastern white cedar also occurred in small pockets throughout. White elm and red maple also occurred in the canopy. The understory included a varied mix of shrub species including silky dogwood, gray dogwood and narrow-leaved meadowsweet, all species appeared to occur in relatively equal propoprtions. Ground vegetation was not observed within the community.
SWD2-2/SWT2-4/MAM2-2 Green Ash Mineral Deciduous Swamp with a complex of Reed-canary Grass Mineral Meadow Marsh and an inclusion of Buttonbush Mineral Swamp Thicket	The dominant vegetation was a canopy of green ash, multiple oak species, Freeman's maple, and hickory species. The sub-canopy consisted of younger green ash and white elm trees. The understory consisted mostly of dogwood species, narrow-leaved meadowsweet and eastern buttonbush. The ground layer was dominated by sedges, reed-canary grass, panicled-aster and smartweed species. There was also a complex of reed-canary grass mineral meadow marsh and an inclusion of buttonbush mineral thicket swamp.
SWD2-2/FOD7-2 Green Ash Mineral Deciduous Swamp with an inclusion of Fresh – Moist Ash Deciduous Lowland Forest	The dominant canopy species were green ash and American elm. Green ash and a hawthorn species dominated the sub-canopy. The understory consisted mainly of gray dogwood, hawthorn, and narrow-leaved meadowsweet. Reed-canary grass, panicled aster, and bitter nightshade made up the ground vegetation.
SWD 2-3* Ash-Poplar Deciduous Mineral Swamp	This community was dominated by green ash in the canopy with eastern cottonwood and trembling aspen also present. The understory consisted of young green ash, wild red raspberry, narrow-leaved meadowsweet and gray dogwood. Virginia creeper was the dominant ground cover within the community with sumac and jewelweed also present.
SWD3 /FOD6-5 Maple Mineral Swamp complex with Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	This community is dominated by a variable mix of red oak, bur oak and silver maple. Sugar maple is also present as an associate. Understory vegetation includes gray dogwood and virginia creeper.
SWD3 /FOD6-5 Maple Mineral Swamp complex with Fresh-Moist Sugar maple-hardwood deciduous forest	This community is dominated by a variable mix of red oak, bur oak and silver maple. Sugar maple is also present as an associate. Understory vegetation includes gray dogwood and virginia creeper.
SWD 3-1 Red Maple Mineral Deciduous Swamp	The canopy of this community contained red maple with less frequent occurrences of American elm, green ash and trembling aspen. The sub-canopy composition was similar. The understorey included Red maple saplings, american elm, common buckthorn and riverbank grape. Ground cover included species such as cinnamon fern, sensitive fern, beggar ticks, Northern bugleweed and false Solomon's seal.

Table 4.3 ELC Overview

ELC Type	Community Description
SWD3-1/ FOD5-3 Red Maple Mineral Deciduous Swamp with inclusion of Dry-Fresh Sugar Maple-Oak Deciduous Forest	The canopy of swamp community is dominated by red maple with green ash, sugar maple and red oak. The understorey of this community consists of spicebush with red maple and green ash saplings**.** A Dry-Fresh Sugar Maple-Oak Deciduous Forest inclusion is found within the above community.
SWD 3-1/SWT 2-9 Red Maple Mineral Deciduous Swamp with Gray Dogwood Mineral Thicket Swamp	This community was dominated by red maple in the canopy with less frequent occurrences of white elm. The understory was dominated by red maple and downy arrowwood. Rough goldenrod was the dominant ground cover within the community with sedge species and reed canary grass also present. The Inclusion was dominated by gray dogwood with almost equal proportions of raspberry and downy arrowwood.
SWD3-1/MAS2-9/SAF1-3 Red Maple Mineral Deciduous Swamp with a Forb Mineral Shallow Marsh and Duckweed Floating-leaved Shallow Aquatic complex	The most abundant species in the canopy were Red and Silver maple, with Red oak and American Beech. The sub-canopy was predominately comprised of Red oak, American Beech and Blue Beech and the understory contained some Black ash with Red Osier dogwood. The ground layer consisted of Sensitive fern, Swamp beggar-ticks, Royal fern and Spinulose wood fern. The above swamp community is complexed with small ponds associated with small shallow marshes which are found throughout.
SWD3-2 Silver Maple Mineral Deciduous Swamp	The canopy in this community primarily consisted of Silver maple, with Green ash, Red oak and Red maple. The sub-canopy also contained Silver maple, with Green ash and Red maple, Bur Oak and Blue Beech. The understory included Buttonbush, Spicebush, winterberry, Highbush Blueberry with components of Silver maple and Green ash, while the ground layer contained sensitive fern, with Tall white aster, reed canry grass, sedges.
SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.
SWD3-3/SWD2-2 Swamp Maple Mineral Deciduous Swamp with a complex of Green Ash Mineral Deciduous Swamp	The canopy was fairly dense and consisted of swamp maple, green ash, and swamp white oak. Swamp maple, green ash, and narrow-leaved meadowsweet predominated in the understory, with rare occurrences of buttonbush and winterberry. Sedges, beggar-ticks, fowl meadow grass and touch-me-not were the most abundant ground vegetation species in a generally diverse layer. Complexed within this community were areas very similar in composition but where green ash dominated the canopy, forming a complex of green ash swamp.
SWD4-1 Willow Mineral Deciduous Swamp	Dominant canopy species were Crack willow, black willow and white willow, with green ash and red maple. Less common canopy species included swamp white oak and bur oak. Sub-canopy species included crack willow, black willow, swamp white oak and manitoba maple. The understory consisted of species such as red-osier dogwood, rough-leaved dogwood, eastern buttonbush, common elderberry, wild red raspberry and narrow-leaved meadowsweet. The ground vegetation layer contained species such as cattail, riverbank grape, virginia creeper, tall goldenrod, bitter nightshade, jewelweed and reed-canary grass.
SWD4-3 White-birch Poplar Mineral deciduous forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.
SWD4-1/SWD1-1 Willow Mineral Deciduous	This swamp complex included areas with varying canopy dominance including some with black willow as the dominant canopy cover, and swamp white oak and chinquapin oak dominating in
SWD4-5*/SWD2-1 Yellow Birch-Red Maple Mineral Deciduous Swamp with a Black Ash Mineral Deciduous Swamp complex	This community consisted of Red maple, Yellow birch and Black ash in the canopy, with infrequent Shagbark hickory and White elm. The ground layer was comprised of Sensitive fern, Moss species, Spinulose wood fern and Ostrich fern. Occurring throughout the community was a complex of Black ash mineral deciduous swamp.
SWD5-1 Black Ash Organic Deciduous Swamp	The canopy in this community consisted of Black ash, Red maple and Yellow birch, with less common occurrances of Freeman's maple, Crack willow and White elm. The understory contained Spicebush and occasionally Crack willow and willow speices. The ground layer species included Sensitive fern, Moss species, Tall white aster and Spinulose wood fern.

Table 4.3 ELC Overview

ELC Type	Community Description
Thicket Swamp (SWT)	
SWT2 Mineral Thicket Swamp Ecosite	Due to restricted property access, this community was assessed through a hedgerow community. Predominantly dogwood and willow shrub cover, this community stretches along the west side of the property.
SWT2-2 Willow Mineral Thicket Swamp	The canopy layer occasionaly consisted of sparse Ash and Willow species. The understory was comprised of Willow species, Red-panicled dogwood and Spiraea species, with occasional lesser components of Eastern Buttonbush, while the ground layer consisted of Cattails, Reed canary grass, Sedge species and various hydrophitic forbs.
SWT2-4 Buttonbush Mineral Thicket Swamp	This community occasionally contained sparse Red maple and ash species in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Highbush Blueberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Beggar-ticks, Fern species, Sedge species, Grass species and Duckweed.
SWT2-4/MAM2-2 Buttonbush Mineral Thicket Swamp with a Reed canary grass mineral meadow marsh inclusion.	This community was comprised primarily of Eastern buttonbush with less frequent occurrences of Winterberry, highbush blueberry, and narrow-leaved meadowsweet. A reed canary grass mineral meadow marsh occurred within the above community.
SWT2-6 Meadowsweet Mineral Thicket Swamp	Occasional tree species occurred, including ash, swamp white oak and willow. The vegetation was dominated by narrow-leaved meadowsweet with silky dogwood, red-panicled dogwood and red raspberry, while the ground layer consisted of wool-grass, reed-canary grass, broad-leaved cattail, beggar-ticks rush and sedge species.
SWT2-6/FOD9-3 Meadowsweet Mineral Thicket Swamp with a complex of Fresh – Moist Bur Oak Deciduous Forest	The canopy consisted of Ash species overtop of the understory of narrow-leaved meadowsweet, red-panicled dogwood, and wild red raspberry. Ground vegetation consisted of rice cut-grass, cattail species, goldenrod species and soft-stem bulrush.
SWT2-9 Grey Dogwood Mineral Thicket Swamp	The canopy of this community included occasional willow trees, bur oak, shagbark hickory, white elm, green ash and cottonwood. The understorey of this community was dominated by grey dogwood, with lesser components of American elm and narrow leaved meadowsweet. The ground cover included species such as reed canary grass, bedstraw species, sedge species, rough goldnerod, avens species, riverbank grape and a horsetail species.
SWT2-9/MAM2-10 Gray Dogwood Mineral Thicket Swamp with an inclusion of Forb Mineral Meadow Marsh	Ash species, staghorn sumac and sugar maple made up the canopy layer. The understory consisted of red-panicled dogwood, wild red raspberry, and silky dogwood. Asters, goldenrod species, and reed-canary grass dominated the ground layer. There was a small forb mineral meadow marsh within the community.
SWT3-4 Buttonbush Organic Thicket Swamp	This community had a canopy composed mainly of eastern buttonbush and winterberry. The sub-canopy was composed of narrow-leaved meadowsweet, while sensitive fern was the sole species found in the understory.
SWT2-13* Dogwood Mineral Thicket Swamp Type	Due to property access, this community could not be identified down to species level. Dogwood species dominate this community.
SWT2-14* Ash-Willow Mineral Thicket Swamp	The canopy in this swamp was composed of green ash and black willow. The sub-canopy was made up of green ash, black willow and various other species of willow. The understory was made up of silky dogwood and common elderberry, while the ground vegetation consisted mostly of reed canary grass, followed by spotted touch-me-not, violet and false nettle.
Marsh (MA)	
Meadow Marsh (MAM)	
MAM Mixed Marsh with a complex of Meadowsweet Mineral Thicket Swamp	This community type was variable in terms of species composition, with no dominance of either forbs or graminoids. Rushes, new-England aster, willow herb, and a smartweed species were the dominant species growing in mixed patches. There was a narrow-leaved meadow-sweet thicket swamp complexed throughout the community.
MAM2 Mineral Meadow Marsh	This community was composed of reed canary grass and soft rush, with various species of sedge. Occasional black walnut and ash occurred in the canopy layer.
MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.

Table 4.3 ELC Overview

ELC Type	Community Description
MAM2-2/FOD9-4 Reed Canary Mineral Meadow Marsh with remnant Shagbark Hickory Deciduous Forest inclusion	This community is largely comprised of Reed Canary Grass and Late Goldenrod, with lesser components of Awnless Brome and New England Aster. An inclusion of Shagbark hickory deciduous forest is found in this community and consists of Shagbark Hickory, Riverbank Grape, White Elm, White Ash and American Basswood in the upper stratum. The understory contained Silky Dogwood and Wild Red Raspberry.
MAM2-2/CUM1-1 Reed Canary Mineral Meadow Marsh with a Dry-Moist Old Field Cultural Meadow complex	The most prevalent species in this community included Reed canary grass, with Blue vervain and Beggar-ticks species in similar proportions. Rushes and grasses were also present. The Cultural Meadow complex included Goldenrod species, Wild teasel, Aster species, Tufted vetch and Common milkweed. Gray dogwood was occasional present in the understory and american elm was an uncommon canopy species.
MAM2-2/MAS2 Reed Canary Mineral Meadow Marsh with a Mineral Shallow Marsh complex	This community was comprised mainly of Reed-canary grass, Smartweed and Hemlock water-parsnip.
MAM2-2/MAS2-1 Reed Canary Mineral Meadow Marsh with a Cattail Mineral Shallow Marsh inclusion	This community consisted largely of Reed canary grass, with Cattails, Bur-reed, Blue vervain, Goldenrod species and Wool grass. Willow shrubs were occasionaly present in the understory.
MAM2-2/MAS2-4 Reed-canary Grass Mineral Meadow Marsh with an inclusion of Broad-leaved Sedge Mineral Shallow Marsh	These scattered communities consisted of small pockets dominated by reed canary grass and were surrounded by agricultural fields. Other species occurred in low abundances and included smartweed species, water purslane, and rush species. The communities contained inclusions in their centers of broad-leaved sedge mineral meadow marsh, which contained such species as lake-bank sedge.
MAM2-2/SWT2-2 Reed Canary Mineral Meadow Marsh with a Willow Mineral Thicket Swamp inclusion	Sparse Hawthorn species were present in the understory layer, while Reed canary grass dominates the ground cover with infrequent Narrow-leaved meadowsweet, Common milkweed, Wild teasel, Dogwood and Goldenrod species. The occurrence of Willow shrubs resulted in the inclusion of a Willow mineral thicket swamp.
MAM2-2/FOD9-4 Reed-canary Grass Mineral Meadow Marsh with an inclusion of Fresh-Moist Shagbark Hickory Deciduous Forest	The ground layer was dominated by reed-canary grass with smaller amounts of aster species and goldenrod species throughout. An inclusion of Fresh – Moist Shagbark Hickory Deciduous Forest was identified within the above community.
MAM2-3 Narrow-leaved Sedge Mineral Shallow Marsh Type	Beaked sedge was the dominant species within this community.
MAM2-6 Broad-leaved sedge Mineral meadow-marsh	This community is dominated by Lakebank sedge in the ground layer, with associates of cattail and Reed canary grass. Understory species were ocassional and included gray dogwood and narrow-leaved meadowsweet.
MAM2-11* Foxtail Mineral Meadow Marsh	This community contained a ground layer of a foxtail species with lesser components of beggar-ticks, cattail and reed canary grass.
MAM2-12* Common Reed Mineral Meadow Marsh	There was no canopy present in this community. The community was dominated by common reed grass with gray dogwood and occasional occurrences of reed canry grass, cattail species, beggar-ticks, and european stinging nettle.
MAM2-13* Rush-Graminoid Mineral Meadow Marsh	Ground cover is dominated by soft rush followed by reed canary grass, a foxtail grass and pointed broom sedge.
Shallow Marsh (MAS)	
MAS Shallow Marsh	This community has less than 25% tree and shrub cover, predominantly grass and sedge species. Areas of standing and pooling water occur frequently
MAS2 Mineral Shallow marsh	This community is dominated by various grass species with cattail and wild teasel also present.

Table 4.3 ELC Overview

ELC Type	Community Description
MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash.
MAS2-1/SAF1-3 Cattail Mineral Shallow Marsh with a Duckweed Floating-leaved Shallow Aquatic inclusion	This marsh community consisted largely of Broad-leaved cattail and Reed-canary grass, with components of Canada and Tall goldenrods. Calico aster was also present. A Duckweed Floating-leaved Shallow Aquatic community occurred as an inclusion within the shallow marsh community.
MAS2-1/FOD8-1 Cattail Mineral Meadow Marsh with Fresh-Moist Poplar Deciduous Forest	This complex community supports a poplar deciduous forest as well as a cattail dominated mineral meadow marsh. Areas for potential vernal pooling occur throughout.
MAS2-4 Broad-leaved Sedge Mineral Shallow Marsh	This marsh community had an understory layer consisting of Narrow-leaved meadowsweet, Eastern Buttonbush, Winterberry, Highbush Blueberry, Common Elderberry and Swamp white oak, with Downy Arrrow-wood. The ground layer consisted of Sedge species with Wool grass, Narrow-leaved cattail, Beggar-ticks and Reed canary grass.
MAS2-9 Forb mineral shallow marsh	Dominated by various forb species including canada goldenrod, tufted vetch, wild teasel, white panicled aster, a lemna sp., grasses, reed canary grass, sedge species, blue flag iris, and water plantain.
MAS2-10* Spike-rush Mineral Shallow Marsh	This community consisted of a shallow marsh containing spike-rush, beggar-ticks, and a bur-reed species.
MAS2-11* Mixed Mineral Shallow Marsh	The dominant species included wool-grass and beggar-ticks with a barnyard grass species and a foxtail species.
MAS2-12* Common Reed Shallow Marsh	This community was dominated by a Common Reed monoculture Representing the entire stand.
Shallow Water (SA)	
Mixed Shallow Aquatic (SAM)	
SAM1-2 Duckweed Mixed Shallow Aquatic	Vegetative species include duckweed, sedge and grass species, blue-flag iris and marsh fern. This community is found in low lying areas amongst areas of upland, transitional swamp, and deciduous swamp communities.
Floating-leaved Shallow Aquatic (SAF)	
SAF1-1 Waterliliy-bullhead lily Floating leaved shallow aquatic	This community is dominated by Bullhead lily and unidentified submergents.
SAF1-3 Duckweed Floating-leaved Shallow Aquatic	This community was a pond dominated by duckweed. Infrequent occurrences of bur oak, narrow-leaved meadowsweet and winterberry were present around the border of the community.

*ELC code not included in the First Approximation of ELC for Southern Ontario

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T01	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-1 Fresh – Moist Oak-Sugar Maple Hardwood Deciduous Forest	This small community is found adjacent to a shallow marsh and abutted by hay fields. The canopy is dominated by red oak, sugar maple and white ash, with ocassional red maple. The understory and ground layer were sparse, consisting of hawthorne species and goldenrod species respectively.
	FOD Deciduous Forest	This community is dominated by deciduous tree canopy cover, and was located throughout the project location. Characteristics of this forest community include conopy cover >60%. Dominance of tree species are variable.
	Cultural (CU)	
	Cultural Woodland (CUW)	
	CUW1-3* Elm-Hawthorne Cultural Woodland	the canopy was relatively open, with less than 60% canopy cover. American elm and hawthorne species dominated with ocassional green ash. The understory was sparse, with only ocassional gray dogwood and raspberry. The ground layer included abindant garlic mustard with goldenrod species and scarlett strawberry. This comunity was highly disturbed.
	Swamp	
	Swamp Thicket (SWT)	
	SWT2-2 Willow Mineral Thicket Swamp	The canopy of this small swamp community was composed of willow at a height of approximately 5 to 6 meters tall. The ground layer consisted mainly of reed-canary grass with occasional occurrences of narrow-leaved cattail, tall manna grass, and a smartweed species. At the time of the survey the ground layer was mostly inundated to a depth of approximately 15 cm.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The understory consisted of Reed canary grass and Canada goldenrod. The ground layer dominated by common water plantain with occasional occurrences of Canada goldenrod and Reed canary grass. The community was associated with a hedge row and drainage ditch feature.
	Shallow Marsh (MAS)	
	MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash.
	MAS2-4 Broad-leaved sedge mineral shallow marsh	This community had an understory consisting of narrow-leaved meadowsweet and red-berried elderberry at less than 60% canopy cover. The Understory was the dominant vegetation and included lakebank sedge as the predominant vegetation, with reed canary grass and cattail occuring throughout.
T02, T33	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5/MAM2-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with an inclusion of Reed-canary Grass Mineral Meadow Marsh	This community was assessed from the edge due to lack of property access. The most abundant canopy species in this community were shagbark hickory, swamp maple, red oak, and sugar maple. The understory consisted primarily of wild red raspberry, blue beech and hawthorn. A strawberry species was the most abundant ground vegetation species visible, followed by poison ivy and mayapple, and there were fewer occurrences of wood nettle and sedges.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old field cultural meadow	This small community adjacent to the northern property boundary, was an open community typical of other CUM1-1 communities in the study area. Typical ground vegetation consists of grasses and forbs, and those most commonly observed include goldenrods, panicled-aster, scarlet strawberry, and wild carrot.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Swamp	
	Deciduous Swamp (SWD)	
	SWD2-2/MAM2-6 Green ash mineral meadow marsh with an inclusion of Broad-leaved sedge	The most abundant canopy species in this swamp were green ash, trembling aspen, and bur oak. The understory was made up of narrow-leaved meadowsweet and white elderberry, and the ground vegetation consisted mostly of reed-canary grass, wild strawberry, avens, garlic mustard, and sedges. There was an inclusion of broad-leaved sedge mineral meadow marsh within the community.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This community had a sparse canopy (<25% cover) of green ash, American elm, and crack willow above the ground layer dominated by reed-canary grass with occasional occurrences of common milkweed and grass species. The community was associated with a drainage feature.
T04	**Swamp (SW)**	
	Thicket Swamp (SWT)	
	SWT2-2 Willow Mineral Thicket Swamp	This community was located at the southwest corner of the property. The dominant canopy species was willow, followed by a moderately thick understory of eastern buttonbush and red-panicled dogwood. Ground vegetation consisted of reed-canary grass, sedges and various hydrophitic forbs. The community contained a pool of standing water of at least 1 to 2ft in depth over 30% of its area. There was an inclusion of cattail shallow marsh.
	SWT2-4 Buttonbush Mineral Thicket Swamp	A dense understory layer of 1-5m tall eastern buttonbush dominated this community, with a much sparser canopy (<25% cover) of bur oak and willow around the edges. Sedges, marsh fern, and beggar-ticks were the most abundant ground layer species. About 10% of the community's area was under standing water of about 1ft deep.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1 Mineral Cultural Meadow	This community is found throughout the study area, ranging from low to high levels of disturbance. A variety of species were observed within these communities, and include (but not limited to) goldenrods, asters, dandelions, and several grass species.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This community was a small wet meadow marsh in a slight depression surrounded by agricultural fields and associated with a drainage ditch. The ditch and part of the surrounding meadow contained 5 to 10cm of water. The dominant species was reed-canary grass, followed by smartweed, a panicum species, and blue vervain. It was connected by a shallow drainage ditch to the nearby small pockets of narrow-leaved meadowsweet thicket swamp and white swamp oak deciduous swamp.
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This was a small hedgerow-sized strip of meadow marsh dominated by reed canary grass with some scattered narrow-leaved meadowsweet, willow, and dogwood species.
T05	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-1 Fresh – Moist Oak-Sugar Maple Hardwood Deciduous Forest	The most abundant canopy species in this community was red oak, followed by sugar maple and green ash. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was equally comprised of sugar maple, American beech, blue beech and spicebush. Spotted touch-me-not, large leaved aster and may-apple were the main ground vegetation species visible, followed by Virginia creeper.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 old field dry-moist cultural meadow	This open community was dominated by a fairly dense 2 meter high layer of goldenrods, teasel and wild carrot. Smaller amounts of grasses, asters, and tufted vetch were observed occasionally.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T06	**Swamp (SW)**	
	Thicket Swamp (SWT)	
	SWT2-4 Buttonbush Mineral Thicket Swamp	This was a small community centered within an agricultural field. Canopy height did not exceed 1.5m and exhibited heavy dieback but with vigorous regeneration within the ground cover. No other woody species were observed. Herbaceous species consisted largely of pale smartweed, with fewer occurrences of blue vervain, reed-canary grass, and sedge/rush species. Surface water was present with a depth of approximately 10cm.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh (north of residential area)	This community occupies a relatively small patch of land extending north from the residential area. The dominant species was reed-canary grass, followed by smaller components of nodding beggar ticks and smartweed. There was approximately 18cm of water pooled under the vegetation and a small duckweed dominated open aquatic inclusion at its north end.
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh (east of residential area)	This community is located within a hay field to the east of the residential area and occupies a low point in the surrounding landscape. It was dominated by reed-canary grass with smaller amounts of teasel and goldenrod closer to its edges. Some surface water up to 20cm deep was present over approximately 20% of its area. There was a small open aquatic inclusion with duckweed in its center.
	MAM/SWT2-6 Mixed Marsh with a complex of Meadowsweet Mineral Thicket Swamp	This community is a narrow marsh that runs along a portion of the western edge of the property, and represents an unplowed drainage area within surrounding agricultural fields. It was variable in terms of species composition, with no dominance of either forbs or graminoids. Rushes, new-England aster, willow herb, and a smartweed species were the dominant species growing in mixed patches. Some surface water was present in shallow patches. There was a narrow-leaved meadow-sweet thicket swamp complexed throughout the community.
T07	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous Forest Type	This community was assessed from the property line due to restricted property access. This community was dominated by sugar maple and white ash, with American elm, shagbark hickory associates.
	FOD9-6* Fresh-Moist Hickory-Ash-Oak-Elm Deciduous Forest Type	This community was assessed from the property line due to restricted property access. This community was composed of shagbark hickory, green ash, bur oak and American elm
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2/CUM1-1 Reed Canary Mineral Meadow Marsh with a Dry-Moist Old Field Cultural Meadow complex	This community was not subject to a complete inventory and was delineated based on a preliminary assessment and air photo interpretation. The most prevalent species in this community included Reed canary grass, with Blue vervain and Beggar-ticks species in similar proportions. Rushes and grasses were also present. This community appeared to have been tilled in the past; surface water was observed. The Cultural Meadow complex included Goldenrod species, Wild teasel, Aster species, Tufted vetch and Common milkweed.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T08	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5/SWD2-2/MAS2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp and Broad-leaved Sedge Shallow Marsh	This community occupies the southwestern corner of the property, and had a high proportion of young regenerating trees and saplings. The tallest canopy layer was fairly open at just under 60% cover. Dominant species were red and white oak with sugar maple. The sub-canopy was much denser and consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the thick understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. There were cut stumps throughout the community indicating it had undergone logging in the past. Complexed within this community were two wetland communities – green ash mineral deciduous swamp and broad-leaved sedge shallow marsh. Most of the swamp pockets had pools of water at least 20cm deep and abundant emergent vegetation.
	FOD9-1/SWD2-2/MAS2-4 Fresh – Moist Oak – Sugar Maple Deciduous Forest with a Green Ash Swamp complex and inclusion of Broad-leaved Sedge Mineral Shallow Marsh	This community occupies the southeastern corner of the property and contains a green ash mineral deciduous swamp complex. Dominant canopy species were red and white oak with sugar maple and ash species. Smaller components of red maple and swamp white oak were also present and primarily occupied a transition zone between the forest and swamp communities. The sub-canopy was denser than the canopy and consisted of sugar maple with a much smaller proportion of hop hornbeam and American beech. The understory appeared to consist exclusively of sugar maple, and the dominant ground layer species were wild red raspberry and avens. There was evidence of recent and past logging activity. A green ash swamp was complexed within the community and there was a small broad-leaved sedge shallow marsh located along the western edge.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old Field Meadow	This was a small community near the center of the western half of the property. It was an open community typical of other CUM1-1 communities in the study area. Typical ground vegetation consists of grasses and forbs, and those most commonly observed include goldenrods, panicled-aster, scarlet strawberry, and wild carrot.
T09, T51	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-1 Fresh-Moist oak – sugar maple deciduous forest	The most abundant canopy species in this community were sugar maple, white oak and red oak. The understory consisted primarily of raspberry species., mapleleaf viburnum and witch hazel. Ground vegetation was dominated by aster species rough goldenrod, spotted crane's bill, and white avens.
	FOD9-1/SWD3-1/MAS2-4 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Red Maple Mineral Deciduous Swamp and Broad-leaved Sedge Mineral Shallow Marsh complex	This community, located in the southern portion of the property, had a canopy of Sugar maple, Red oak, White pine and Ash species. The sub-canopy contained Sugar maple, Hop hornbeam, Red oak and White oak. The understory consisted of Sugar maple, American Beech, Hop hornbeam and Blue beech, while the ground layer included Millspaugh's blackberry, Pennsylvania sedge, Maple-leaved viburnum and Wild red raspberry. Evidence of disturbance was present as garbage (old cars/sheds), old roads and some logging. Areas of Red Maple Deciduous Swamp and Broad-leaved sedge Shallow Marsh were found throughout the forest community and included as a complex. Water of 15cm in depth was observed at a potential seep where Water-cress was present. The soil in the Oak-Sugar maple deciduous forest were a sandy clay with a moisture regime of 6 and mottles at 25cm.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD3-3 Swamp maple mineral deciduous swamp	The most abundant canopy species in this swamp were freeman's maple and green ash. The understory was made up of button bush, and the ground vegetation consisted mostly of sensitive fern and eastern marsh fern with false nettle and fowl mannagrass.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Thicket Swamp (SWT)	
	SWT2-4 Buttonbush Mineral Thicket Swamp	This community contained sparse Red maple in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Fern species, Sedge species, Grass species and Duckweed. Water was present throughout this community at a depth from 5-40cm.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, various grass species and Hemlock water-parsnip. Pooled and running water of approximately 5cm in depth was present throughout and was observed running below ground.
	Shallow Marsh (MAS)	
	MAS2-4 Broad-leaved sedge mineral shallow marsh	Sparse Bur oaks were observed in the canopy layer in this community and low numbers of Narrow-leaved meadow sweet were present in the understory. The most abundant species present were found in the ground layer, which consisted of Sedge species, Narrow-leaved cattail and Beggar-ticks species. Pooled water of 5-20cm in depth was found throughout the community.
	MAS2-9 Forb mineral shallow marsh	This site was an area measuring approximately 20 x 25m with a depth of water approximately 12cm. Species present included a lemna sp., grasses, and water plantain.
T10, T37	**Swamp**	
	Deciduous Swamp (SWD)	
	SWD3-1/MAS2-9/SAF1-3 Red Maple Mineral Deciduous Swamp with a Forb Mineral Shallow Marsh and Duckweed Floating-leaved Shallow	The most abundant species in the canopy were Red and Silver maple, with Red oak and American Beech. The sub-canopy was predominately comprised of Red oak, American Beech and Blue Beech and the understory contained some Black ash with Red Osier dogwood in low abundance. The ground layer consisted of Sensitive fern, Swamp beggar-ticks, Royal fern and Spinulose wood fern. The above swamp community is complexed with small ponds associated with small shallow marshes which are found throughout. The soil in the deciduous swamp was found to be a silty very fine sandy clay loam with a moisture regime of 6 and both mottles and gley at 20cm. The depth to bedrock was >120cm.
	Marsh (MA)	
	Shallow Marsh (MAS)	
	MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail surrounding an associated open aquatic feature (SWM pond). Other species present included Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Less abundant species included Calico aster and a few planted Cottonwood trees.
	Forest (FO)	
	Deciduous Forest (FOD)	
	FOD3-1 Dry to Fresh Poplar Deciduous Forest	Cottonwood species, Sugar maple, American basswood and Red oak were the most abundant canopy species in this community. The sub-canopy included mainly Sugar maple, Trembling aspen and Cottonwood species. The understory was comprised of Spicebush, Sugar maple, Trembling aspen and Gray dogwood, while the ground layer contained Currant species, Spicebush, Tall goldenrod and Canada goldenrod in equal proportions. Ditches were found running along the border of this community as well as within. Large amounts of brush and wood piles were also observed. The soil was a sandy clay with a moisture regime of 2 with mottles and gley observed at >40cm. Depth to bedrock was >120cm.
	FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest Type	The canopy species in this community included sugar maple, with american basswood, green ash, red maple, American elm and black cherry associates. The Sub-canopy consisted of sugar maple, while the understory contained sugar maple and black cherry. The ground layer consisted of species such as zig-zag goldenrod, aster species and grasses.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T11, T12, T13, T41, T72, T91	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, American basswood and Eastern cottonwood. The sub-canopy was also dominated by Sugar maple, with Red oak, American basswood and Blue beech, while the understory primarily consisted of Sugar maple, Red oak and Blue beech in roughly equal proportions. Some obvious deep depressions which could become seasonally flooded were observed in this community. The soils in this community were a fine silty-clay-loam with a moisture regime of 2.
	FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous Forest	The most abundant canopy species in this community included Sugar maple, White ash, Red oak and American basswood. The sub-canopy consisted of Sugar maple, American basswood, White ash and Red oak. Species in the understory included Spicebush, Sugar maple and White Ash, while the ground layer consisted of Spicebush, Enchanter's nightshade, Solomon's seal species and Sensitive fern. The soil was a sandy clay with a moisture regime of 2 with mottles and gley observed at >40cm. Depth to bedrock was >120cm.
	FOD5-9 Dry-Fresh Sugar Maple-Red Maple Deciduous Forest	The canopy of this community consisted of Sugar maple and Red maple in roughly equal proportions, with some Red oak and White birch. The sub-canopy included Sugar maple and Red maple, with Shagbark hickory and Red oak in approximately equal proportions. The understory primarily contained Blue beech and American beech with sparse occurrences of American elm and White birch. The soils in this community were a fine silty-clay-loam with a moisture regime of 3.
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest Type	The canopy species found in this community were sugar maple, Red Maple, Black Cherry and American basswood. The Sub-canopy consisted of Alternate leaved Dogwood, American Basswood and Ironwood. The understory consisted primarily of Red raspberry, Spicebush and Blue Beech, while the ground layer contained Red baneberry, Trillium species, Wood nettle and Rose twisted stalk. The soil was a fine sand with mottles at 35cm and a moisture regime of 5.
	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	This community was subjected to only a cursory walkthrough due to time constraints and was delineated based primarily on assessment of adjacent lands and air photo interpretation.
	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This mature community had a canopy dominated by red oak, green ash and American Beech. The sub-canopy was also abundant and included Ironwood, red oak and american beech, with some instances of basswood. Understory vegetation included blue beech and ironwood in equal proportions, with some red ash and sugar maple also present. the ground layer was composed of blue cohosh and lance-leaved aster, with false solomon's seal and poison ivy.
	Cultural (CU)	
	Cultural Plantation (CUP)	
	CUP3-2 White Pine Coniferous Plantation	This community had a canopy dominated by White pine, with sparse occurrences of White ash. The sub-canopy was also dominated by White pine, with infrequent White spruce and Large-tooth aspen, while the ground layer consisted of Sensitive fern and Spicebush in equal proportions. An understory layer was not present. The soils in this community were a sandy clay with a moisture regime of 2 and with mottles and gley observed at >40cm. Depth to bedrock was >120cm. Immediately adjacent to this community, bordering the agricultural land, was a narrow swath containing Sugar maple, Tall goldenrod, Lilac and Trebling aspen among other species. A drainage feature occurred along the edge of this area. This area was too small to consider a separate community.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Swamp (S)	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This community was associated with a large drainage ditch and was composed of a 3 meter wide strip of reed-canary grass on each bank.
T14, T43, T44	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD7-6* Fresh-Moist Swamp-Red Maple Lowland Deciduous Forest	This forest community had a canopy which was dominated by Freeman's maple, with components of Red maple, Black cherry and Black ash. The sub-canopy also largely consisted of Freeman's maple, with fewer occurrences of Red maple, Black cherry and Black ash. The understory included mainly Spicebush, with some Red maple and Black cherry, while the ground layer consisted of Sensitive fern, Spicebush and Spinulose wood fern. Some surface water occurred along the border of this community adjacent to the Black ash mineral deciduous swamp (SWD2-1). This community contained a clay-loam soil with an organics layer of <1cm and a moisture regime of 4. Depth to bedrock was >120cm.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old field cultural meadow	This community consisted of several forbs and grasses in varying composition and dominance including Goldenrod species, ox-ey daisy, wild teasel, wild carrot, tufted vetch, reed canary grass, Awnless brome, Scarlet strawberry, Knapweed, Kentucky bluegrass
	Cultural Thicket (CUT)	
	CUT1-4 Gray Dogwood Cultural Thicket	The canopy of this community type occasionally contained sparse occurrences of species such as Manitoba Maple, Bur Oak, White oak, Red maple, White Ash and American Elm. The understory of this community was comprised largely of Gray dogwood, with Hawthorn species, Narrow-leaved meadowsweet, staghorn sumac, and Rose species. The ground layer included Grass species, New England aster, Oxeye daisy, Riverbank grape and wild carrot.
	CUT1-7* Red Osier Dogwood Cultural Thicket	This cultural thicket community consisted of Spicebush occurring in the sub-canopy layer, with the understory comprised of Canada goldenrod, Tall white aster, Spicebush and Red osier dogwood. Tall white aster was also a ground layer component.
	Cultural Woodland (CUW)	
	CUW1-3*/MAM2-6 Freeman Maple Cultural Woodland with a Broad-leaved Sedge Mineral Meadow Marsh inclusion	The canopy of this community consisted of Cottonwood species, with the sub-canopy containing both Cottonwood and Freeman's maple. The understory included Freeman's maple as well as Canada goldenrod, Tall white aster, Common boneset. Evidence of past clearing was observed and this community appears to be the result of regeneration. A broad-leaved sedge meadow marsh occurred as an inclusion within the woodland community. The cultural woodland contained a clay-loam soil with an organics layer of 22.8cm in depth and a moisture regime of 4-5. Depth to bedrock was >120cm.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD1-1 Swamp White Oak Deciduous Swamp	The canopy was dominated by swamp white oak, with less common occurrences of red maple, red oak and green ash. The understory consisted of species such as narrow-leaved meadowsweet and red-panicled dogwood. Reed-canary grass, sensitive fern, blue flag iris and wild red raspberry were species occurring in the ground layer.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
	SWD5-1 Black Ash Organic Deciduous Swamp	In this community, both the canopy and sub-canopy were largely comprised of Black ash and Freeman's, with smaller numbers of Crack willow and Willow species. The understory included mainly Spicebush, with few Crack willow and Willow species present. The ground layer included Sensitive fern and Tall white aster, with sparse occurrences of Riverbank grape and Nettle species. Surface water occurred throughout the community and ranged in depth from 30-50cm. The soil in this community was organic (Om layer of 50.8cm) and a moisture regime of 7. Depth to bedrock was >120cm.
	SWD3-2 Silver Maple Mineral Deciduous Swamp	The canopy in this community primarily consisted of Silver maple, Green ash, Red oak and Red maple. The sub-canopy also contained Silver maple, Green ash and Red maple. The understory was predominately Spicebush, with lesser components of Silver maple and Green ash, while the ground layer was largely sensitive fern with Tall white aster and Spicebush also present. Evidence of disturbance were observed as a small shed was found at the edge of this community. Surface water was also observed throughout and the community was located adjacent to a large area of open water. A drainage ditch also occurred along its border.
	Marsh (MA)	
	Shallow Marsh (MAS)	
	MAS2-1/SAF1-3 Cattail Mineral Shallow Marsh with a Duckweed Floating-leaved Shallow Aquatic inclusion	This marsh community consisted largely of Broad-leaved cattail and Reed-canary grass, with components of Canada and Tall goldenrods. Sparse Calico aster were also present. A Duckweed Floating-leaved Shallow Aquatic community occurred as an inclusion within the shallow marsh community.
T45, T46, T47	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	The canopy in this community was dominated by Green ash, with Red maple and sparse White elm and Trembling aspen. Green ash and White elm were the most abundant species in the sub-canopy, with infrequent occurrences of Red maple and Trembling aspen. The understory included Green ash, White elm, Staghorn sumac and Nannyberry, while the ground layer was largely Sensitive fern with Canada and Tall goldenrods and Raspberry species. The soil was a sandy –clay with a moisture regime of 6 and mottles observed at 45cm. Depth to bedrock was >120cm. A wet area in the center of the community containing surface water and consisting of Cattails and Bullrush was identified as an inclusion. A pathway was ploughed from this community to a nearby drainage ditch.
	FOD9-2/MAM2-11* Fresh-Moist Oak-Maple Deciduous Forest with a Common Reed Mineral Meadow Marsh inclusion	This community had a canopy consisting of Red oak, Red maple and Green ash, with few Black cherry and Willow species. The sub-canopy also contained Red oak and Red maple with sparse occurrence of Black cherry and Green ash. The understory included mainly spicebush, with American beech and Currant species, while the ground layer was comprised of Calico aster, Canada goldenrod, Reed-canary grass and Riverbank grape. The community is fairly disturbed as roads and trails exist throughout. The soil was a clay-loam with a moisture regime of 5-6. Mottles and gley were observed at >80cm and the depth to bedrock was >120cm. An inclusion of a Common reed meadow marsh was present at the southern edge of the community.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Cultural (CU)	
	Cultural Thicket (CUT)	
	CUT1-7* Red-Osier Dogwood Mineral Cultural Thicket	This community consisted predominately of Red-osier dogwood, Staghorn sumac and American elm, with sparse Bitternut hickory. The ground layer included Raspberry species, Tall goldenrod, Canada goldenrod and Tall white aster. An area of open water was observed adjacent to west of this community.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD5-1 Black Ash Organic Deciduous Swamp	The canopy in this community consisted of Black ash, Red maple and Yellow birch, with infrequent Freeman's maple and White elm. The understory contained occasional Spicebush and the ground layer included Sensitive fern, Moss species, and Spinulose wood fern. Small pools of surface water were observed throughout the community. The soil was organic (Om) with a moisture regime of 7. Depth to bedrock was >120cm.
T18	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-2/SWD1-2 Fresh – Moist Oak – Maple Deciduous Forest with a complex of Bur Oak Mineral Deciduous Swamp	This community occupied approximately the eastern third of the property. The canopy was dense, with red oak, white oak, sugar maple and red maple as dominants. Red oak, sugar maple, American beech, and white oak made up the sub-canopy. The thick understory consisted of blue beech, American beech, sugar maple and hop hornbeam, while sedges, goldenrod, large-leaved aster and avens made up the ground layer. The moisture regime was variable throughout the community but fell between 4 and 6 due to the location of the mottles in the soil profile. In some areas the soils were clay dominated and had a moisture regime of 6, in others there was a higher sand content and mottles at 40cm. Complexed within this forest was a bur oak mineral deciduous swamp. Some portions of the swamp complex were more dominated by red maple or green ash with some younger oaks in lower proportions. There was evidence of logging and recreational activities taking place within the community and its complex.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1/MAM1-5 Dry – Moist Old Field Meadow with an inclusion of Graminioid Mineral Meadow Marsh	Species observed were typical of other dry-moist old field communities in the study area, with goldenrods, asters, and grasses dominating.
	Cultural Thicket (CUT)	
	CUT1-4 Gray Dogwood Cultural Thicket	This small community was located at the far eastern corner of the property and bordered by a railroad track to the east. The thick canopy layer was dominated by 3 to 5m tall shrubs made up of red-panicled dogwood, narrow-leaved meadowsweet, and hawthorn. The understory was also thick and consisted mostly of raspberry species, nannyberry and downy arrow-wood. Grass, goldenrod, and avens species dominated the ground layer.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	As is typical of these communities, reed canary grass dominated the herbaceous layer, with rare occurrences of broad-leaved cattail. Very rare shrub occurrences included narrow-leaved meadowsweet, buttonbush, and common elderberry. No surface water was observed.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Shallow Marsh (MAS)	
	MAS2-10* Mixed Mineral Shallow Marsh	This community was a very small shallow marsh located in the middle of a soy field. The dominant species included wool-grass and beggar-ticks with a barnyard grass species and a foxtail species. There was some shallow surface water of 5 to 10cm throughout.
T19	**Cultural (CU)**	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old Field Meadow	This community is small and surrounded by agricultural fields. Trees within the community are limited to a few red maple saplings while shrubs are limited to a few willows. Herbaceous vegetation dominates the community and grasses, goldenrod and horsetail species are dominant.
	Cultural Thicket (CUT)	
	CUT1-1 Staghorn Sumac Cultural Thicket	This small cultural thicket community was almost entirely dominated by staghorn sumac in the understory.The sub-canopy included ocassionaly instances of white elm and green ash. No ground layer was present in this community.
	CUT1-4 Gray Dogwood Cultural Thicket Type	This thicket community is dominated by grey dogwood, with manitoba maple frequently occuring throughout. A hedgerow with a variety of deciduous tree species are found on both sides of this community.
	Swamp (SW)	
	Thicket Swamp (SWT)	
	SWT2-9 Grey Dogwood Mineral Thicket Swamp	This community is small and within an agricultural field. The canopy of this community includes occasional willow trees, green ash and cottonwood. The understorey of this community is dominated by grey dogwood followed by American elm. The ground cover is dominated by reed canary grass followed by a bedstraw species, riverbank grape and a horsetail species.
T20	**Swamp (SW)**	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	This swamp community had a canopy consisting of Green ash, Red maple and Silver Maple. The understory contained mainly spicebush, Virginia creeper and Maple-leaved viburnum, while the ground layer included Jewelweed, Sensitive fern and Bladder sedge species. Vernal pooling occurred throughout the community.
	Forest (FO)	
	Deciduous Forest (FOD)	
	FOD 7-2 Fresh-Moist Ash Lowland Deciduous Forest	The dominant canopy cover in this community was green ash, with slippery elm and trembling aspen also present. The understory consisted primarily of wild red raspberry rose species and spicebush. Virginia creeper, rough goldenrod, jewelweed and yellowish enchanter's nightshade.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD 3-1/SWT 2-9 Red Maple Mineral Deciduous Swamp with Gray Dogwood Mineral Thicket Swamp	This community was dominated by red maple in the canopy with rare occurrences of white elm. The understory was dominated by red maple and downy arrowwood. Rough goldenrod was the dominant ground cover within the community with sedge species and reed canary grass also present. The Inclusion was dominated by gray dogwood with almost equal proportions of raspberry and downy arrowwood.
	SWD 2-2(a) Green Ash Mineral Deciduous Swamp	This community was dominated by green ash with lower proportions of red maple and red oak in the canopy. Understory vegetation consisted of shrubs including gray dogwood and spicebush. The Ground cover in this community included jewelweed species, rough goldenrod and various sedges and grasses in abundance. Shallow pools of water with active amphibian breeding were located throughout the community.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T21, T22, T61	SWD2-2(b) Green Ash Mineral Swamp	This green ash dominated community was similar to the previous but overall stand age was much younger, other species found in the canopy included red maple. The understory was considered very dense in this community and was dominated by narrow-leaved meadowsweet and gray dogwood in equal proportions, also present in the understory was wild red raspberry. Ground cover in this community included graceful sedge, rough goldenrod and reed canary grass.
	SWD 2-2 (c) Green Ash Mineral Swamp	This green ash swamp was dominated by green ash, with white elm and trembling aspen. The understory was dense and dominated by gray dogwood with downy arrowwood and narrow-leaved meadowsweet. Ground cover in this community consisted of sedge species, reed canary grass, Virginia creeper and rough goldenrod. This community was relatively young and almost fit under a thicket swamp designation.
	Thicket Swamp (SWT)	
	SWT 2-9 Gray Dogwood Thicket Swamp	This community was dominated by Gray dogwood in the canopy with narrow-leaved meadowsweet in lower proportions. No understory vegetation was present. Ground cover included sedge species, rough goldenrod and species of avens.
	Cultural (CU)	
	Cultural Thicket (CUT)	
	CUT1-4 Gray Dogwood Cultural Thicket	The canopy in this community was dominated by occasional red maple. The understory was the most abundant layer and was dominated by gray dogwood with narrow-leaved meadowsweet; downy arrowwood and black cherry were also present in the understory. Ground cover vegetation included various grasses in abundance, as well as narrow-leaved meadowsweet, gray dogwood and various species of goldenrod.
	CUM1-1 Dry-Moist Old field cultural meadow	This cultural meadow community included numerous forb and grass species. Dominant cover included grasses including reed canary grass, goldenrods and new England aster.
T23, T24, T49	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD7-2 Fresh – Moist Lowland Ash Mineral Deciduous Forest	This community was assessed from the edge due to property access limitations. Green ash, eastern cottonwood, and white elm were the most abundant canopy species. Goldenrod was the most abundant ground vegetation species, followed by reed canary grass, avens, river-bank grape, and common burdock.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
	SWD 2-3* Ash-Poplar Deciduous Mineral Swamp	This community was dominated by green ash in the canopy with eastern cottonwood and trembling aspen also present. The understory consisted of young green ash, wild red raspberry, narrow-leaved meadowsweet and gray dogwood. Virginia creeper was the dominant ground cover within the community with sumac and jewelweed also present.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T27, T28	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	This community occupies approximately the southwestern third of the property. The most abundant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The moderately thick understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. Soils were variable through the community, with a clay dominated soil in some areas and a sandier, siltier component in others. Mottles were present within 17cm and 25 cm of the surface respectively for each type. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools (5 -10cm) with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.
	Cultural (CU)	
	Cultural Thicket (CUT)	
	CUT1-4 Gray Dogwood Cultural Thicket	The most abundant canopy species were bur oak, white oak, and American elm. Gray dogwood, hawthorn, and staghorn sumac made up the thick understory, while goldenrod, asters, and ox-eye daisy comprised the ground layer. A deer bed area was visible inside the community.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-Canary Grass Mineral Meadow Marsh	This community was a small strip consisting predominantly of reed canary grass meadow marsh, with a few mixed tree and shrub species at either end. The dominant species were reed-canary grass with broad-leaved cattail, and the occasional goldenrod, teasel, and wild carrot confined mainly to the border. A few oaks and elms made up a hedgerow habitat on either end of the community.
T29	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite	This community occupied a steep slope along the central eastern edge of the riparian valley. It was fairly mixed in terms of composition, with sugar maple, red oak, large-tooth aspen and hemlock dominating the canopy. The sparse sub-canopy contained primarily sugar maple, hop hornbeam and American beech. The understory consisted exclusively of scattered sugar maple saplings, while the ground vegetation was dominated by sugar maple, panicled aster, avens, and thimble berry.
	FOD6-5/SWD3-1 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Red Maple Mineral Swamp	This community occupied the northeastern tip of the riparian valley and was situated primarily on table land. The dominant canopy species were sugar maple, red oak, and American beech, and there was a thick sub-canopy of sugar maple, hop hornbeam and American beech. The understory consisted mostly of saplings of sugar maple and hop hornbeam. Panicled aster, avens, and raspberry species made up the fairly sparse ground layer. Complexed within this were a few small pockets of red maple mineral swamp, containing shallow pools of water of about 30cm in depth.
	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community was located in the south-central portion of the riparian valley and occupied the bottomland therein. It had a fairly open canopy (approximately ≤60%) consisting of green ash and a smaller component of shagbark hickory. The sub-canopy was made up of green ash, sugar maple, and white elm. The understory consisted of hop hornbeam, sugar maple, green ash and blue beech. Raspberries, panicled aster and moneywort dominated the patchy ground cover. The soils were loam and clay dominated and the moisture regime was 5. A small creek flowed through the community and there was evidence of seasonal flooding.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This community ran from the northern end of the wooded riparian valley northwards to the northern tip of the property. It consisted of an open community of reed-canary grass with much smaller amounts of European stinging nettle and teasel. It was associated with a creek or drainage feature that connected the northern edge of the property to the riparian valley. It contained an open aquatic community at its northern tip.
T31	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-3 Dry – Fresh Sugar Maple – Oak Deciduous Forest	This community surrounded a buttonbush mineral thicket swamp and extended northwards onto the adjacent property. The air photo indicates that there is likely more swampy terrain in the off-site portion potentially representing a forest/swamp complex. The canopy consisted of a moderately dense layer of sugar maple, white oak, red oak, and shagbark hickory, with a thinner sub-canopy of American beech and blue beech. The ground vegetation was dominated by raspberry species, goldenrod, and creeping bugleweed.
	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	This community was located in the northeastern corner of the property. The canopy consisted of a thick layer of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the moderately thick sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated a sparse ground layer. There was a swamp maple swamp complex within the community.
	Swamp	
	Thicket Swamp (SWT)	
	SWT2-4 Buttonbush Mineral Thicket Swamp	This community was located just inside the property near the center of the northern boundary. There were a few scattered ash trees overtopping the much thicker and dominant sub-canopy of buttonbush. Smaller amounts of raspberry and narrow-leaved meadowsweet were scattered throughout. The ground vegetation was sparse and consisted of bitter nightshade and goldenrod. There was approximately 25 to 50cm of standing water in the center of the community.
	SWT2-4 Buttonbush Mineral Thicket Swamp	This community was located within the FOD6-5 in the northeastern corner of the property. The community was dominated by a thick shrub layer of eastern buttonbush followed by lesser amounts of winterberry and hihbush blueberry. The ground vegetation was thin and consisted primarily of ferns, sedges, and beggar ticks.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD 4-1 Willow Mineral Deciduous Swamp	This community was dominated by willow tree species and green ash. The understory consisted primarily of common elderberry and wild red raspberry. Lesser duckweed was the dominant ground vegetation, followed by reed canary grass and jewelweed. This Community is heavily culturally influenced with agriculture occurring right up to the edge.
	Thicket Swamp (SWT)	
	SWT2-6 Meadowsweet Mineral Thicket Swamp	This was a small community located in the center of the northern tip of the property and ran southwards along the edge of the tilled field. Narrow-leaved meadowsweet dominated the shrub layer along with smaller proportions of red-panicled dogwood and wild red raspberry. The thick ground layer consisted of goldenrod species, grass species, and rice cut-grass.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T32	**Cultural (CU)**	
	Cultural Plantation (CUP)	
	CUP3-2/CUM1-1/SWT2-6 White Pine Coniferous Plantation with a complex of Dry-Moist Old Field Meadow and Meadowsweet Mineral Thicket Swamp	This vegation type was made up of a very complex intermixing of young to mid-age coniferous plantation, old field meadow, and swamp thicket. The dominant tree species throughout was white pine, planted in irregular patches of rows; these were intermixed with a ground layer typical of old field meadow communities, consisting of grasses, tall goldenrod, flat-topped bushy goldenrod, and asters. There was also a high proportion of wetter meadow species such as rushes. The ground layer between the rows of planted pine trees was mowed, as well as large sections of the meadow throughout. In general the ground was very moist, with frequent puddling observed. There were several meadowsweet mineral thicket swamps distributed throughout.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM 2-2 Reed Canary Mineral Meadow Marsh	This community was dominated by Reed canary grass in the ground layer along with oxeye daisy and wild teasel. Some areas included small patches of shagbark hickory cultural woodland in the canopy as well as including occasional green ash and elm. This Community is heavily culturally influenced with agriculture occurring right up to the edge.
T34	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous forest	American Beech was the most abundant species in both the canopy and the understory, with Sugar maple also abundant in these stratums. There was evidence of management/disturbance as some stumps and garbage were observed. The ground layer was comprised predominately of Sugar maple and White Ash saplings, with some occurrences of Spotted Jewelweed and Jack-in-the-pulpit. This community had variable microtopography and more hydrophilic species were observed in low lying pockets or along drainage paths
	Cultural (CU)	
	Cultural Thicket (CUT)	
	CUT1 Mineral Cultural Thicket Ecosite	Variable species composition, including sumac, dogwoods and American elm. This thicket divided agricultural fields.
	Forest (FO)	
	Deciduous Forest (FOD)	
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This forest community occupied a large swathe of the southwestern section of the property. At its southern edge, it sloped very steeply to the adjacent floodplain community. The dominant canopy species were red oak, sugar maple, green ash, and shagbark hickory. American beech, sugar maple and hop hornbeam dominated the moderately thick sub-canopy and understory layers. The ground layer consisted of large-leaved aster, sugar maple, and sedges.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry – Moist Old Field Meadow	This community was a very small old field meadow located within a soy field near the northwest corner of the property. Typical of other old field meadows within the study area, it was an open community dominated by a dense ground layer of forbs and grasses. The most abundant species included teasel, goldenrods, reed-canary grass, and motherwort.
	Cultural Thicket (CUT)	
	CUT1-7* Hawthorn Mineral Cultural Thicket	This community was located at the southern edge of the property behind a winter wheat field. It consisted of very dense hawthorn-dominated canopy and sub-canopy layers, with smaller amounts of an ash species in the canopy and dogwood in the sub-canopy. The ground layer was moderately thick and made up of a goldenrod species, avens species, and garlic mustard.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T36, T74	**Cultural Woodland**	
	CUW Cultural Woodland	Cultural woodland community, with characteristics of 35-60% tree cover, experiencing frequent maintenance of cultural or anthropogenic-based disturbances.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	This community was a small green ash swamp at the northwest edge of the property. It was associated with a small creek running from west to east across the property as well as the adjacent reed-canary grass mineral meadow marsh. The canopy consisted of green ash, white elm, oak species, and shagbark hickory. White elm and green ash made up the thin sub-canopy. The shrub layer consisted mainly of Freeman's maple and green ash saplings, while reed-canary grass and panicled-aster made up the ground layer. Pooled surface water covered about 70% of the area at depths of up to 60cm.
	SWD3-3 Swamp Maple Mineral Deciduous Swamp	This community was a large swamp located within the FOD6-5. The canopy was dominated by Freeman's maple, green ash, red maple, and white elm; while the thinner sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory was very sparse and consisted mainly of dogwood species and narrow-leaved meadowsweet with a smaller component of winterberry. Sedges, ferns, and beggar-ticks predominated in the ground layer. There were several shallow pools (<60cm deep) throughout and many contained emergent vegetation.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAMM2-2 Reed Canary Grass Mineral Meadow Marsh	This community is found northeast of the proposed location of turbine R11TO36 within the Beaver Creek PSW Complex. Trees and shrubs are absent from this community. The dominant species within this community are reed canary grass followed by grass-leaved goldenrod, swamp milkweed and Kentucky blue grass.
T38	**Cultural (CU)**	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old field cultural meadow	Typical of other old field meadows within the study area, it was an open community dominated by a dense ground layer of forbs and grasses. The most abundant species included teasel, goldenrods, reed-canary grass, and motherwort.
	Marsh (MA)	
	Shallow Marsh (MAS)	
	MAS 2-4 Broad-leaved Sedge Mineral Shallow Marsh	This community was dominated by Sedges in the ground cover with some Reed canary grass and other grass species also present. Understory vegetation was also present and included winterberry, high bush blueberry and common elderberry.
	MAM 2-2 Reed Canary Grass Mineral Meadow Marsh	This community was almost entirely dominated by Reed canary grass in the ground layer. Other species occurred rarely and include narrow-leaved meadowsweet and bur-reed species.
T39	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-1/SWT2-4/SWD1-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Buttonbush Mineral Thicket Swamp inclusion and a Bur Oak Mineral Deciduous Swamp complex	This community had a canopy consisting of White oak, Red oak, Sugar maple and White pine. The sub-canopy contained Hop hornbeam, Blue beech and White pine, while the understory consisted largely of Black cherry, Blue beech, Hop hornbeam and White pine. The ground layer included Sedge species, Large-leaved aster and Millspaugh's blackberry. Evidence of logging was observed in this community. A Buttonbush Mineral Thicket Swamp occurred within this community and was added as an inclusion. The primary species here included Eastern buttonbush, Winterberry, Red-osier dogwood and Narrow-leaved meadow sweet. Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well, with pools of surface water up to 60cm in depth. The soils in this Oak-Sugar maple deciduous forest community had a moisture regime of 5-6.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM 2-2 Reed Canary Mineral Meadow Marsh	This community was dominated by Reed canary grass in the ground layer along with Avens and Jewelweed. NO Canopy or understory vegetation was present.
	Shallow Marsh (MAS)	
	MAS2-4 Broad-leaved sedge mineral shallow marsh	This community occurred in two locations in the southwestern part of the property and consisted of an understory of Dogwood species and Narrow-leaved meadow sweet. The ground layer was comprised of Sedge species, Reed-canary grass, Broad-leaved cattail and Wool-grass. Water depth was approximately 20-30cm.
T42	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-2/SWD3-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest Type	The most abundant canopy species in this community were American Beech and Sugar Maple with some black cherry and yellow birch. The understory consisted primarily of young sugar Maple and American beech with ironwood and black cherry also present. Jack in the pulpit and riverbank grape was the dominant ground vegetation, followed by Canada mayflower and trillium.
	Cultural	
	Cultural Woodland (CUW)	
	CUW1-3* Black Walnut Cultural woodland type	This culturally influenced community was dominated by black walnut in the canopy with lower proportions of scots pine, sugar maple and Manitoba maple. The understory consisted of young black cherry, black walnut and lower proportions of Manitoba maple. Grasses were the dominant ground cover within the community with red raspberry, garlic mustard and goldenrods also present.
T52, T53	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD Deciduous Forest	This community is dominated by deciduous tree canopy cover, and was located throughout the project location. Characteristics of this forest community include conopy cover >60%. Dominance of tree species are variable.
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This community is part of a larger forest and wetland complex located on the adjacent properties (east and north). The dominant canopy species are red and white oak and sugar maple along with a smaller component of shagbark hickory. The sub-canopy consists of sugar maple, red and white oak, and hop hornbeam. Sugar maple and hop hornbeam dominate the thin understory, while the ground layer is made up of Pennsylvania sedge, raspberry species, and avens. There is evidence of ongoing logging and many large trees are marked with tree marking paint.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD3-3 Swamp Maple Mineral Deciduous Swamp	This community occupies a network of lowland among the deciduous forest community described above. The dominant canopy species are Freeman's maple, green ash, American elm, and a small component of swamp white oak. Freeman's maple, American elm, and green ash make up the sub-canopy. The understory is composed of winterberry, highbush blueberry, narrow-leaved meadowsweet, and smaller components of eastern buttonbush and a rose species. Sedges dominated the ground layer along with grasses and ferns. At the time of the survey there were pools of surface water of up to about 2ft deep covering approximately 70% of the land area.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T54	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5/SWD1-2 Fresh-Moist Sugar Maple-hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	In this community the most prevalent canopy species were Red oak, Sugar maple, American beech and White oak. The sub-canopy was comprised of Sugar maple, with American beech and Red oak in equal proportions and some Hop hornbeam. The understory consisted of American beech, Sugar maple and Red oak, while the ground layer included various Raspberry species, Large-leaved aster, with Goldenrod species and Sedge species occurring in equal proportions. Evidence of hunting and logging was observed. The soil in the deciduous forest community was a fine to very fine sandy clay with mottles and gley observed at 20cm. Approximately 60cm of surface water was present in the swamp complex.
T55	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5/MAS2-4/SWT Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Broad-leaved Sedge mineral Shallow Marsh and Thicket Swamp	The dominant canopy species were sugar maple and red oak with a smaller amount of white pine. Hop hornbeam, American beech, black cherry and blue beech dominated the sub-canopy. The understory consisted mainly of American beech, blue beech, and a rose species. Large-leaf aster, blackberry species, and rough goldenrod dominated the ground vegetation. There was a complex of broad-leaved sedge shallow marsh and a thicket swamp occupying lower ground throughout the community.
	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
	Cultural (CU)	
	Cultural Thicket (CUT)	
	CUT1-7* Hawthorn Cultural Thicket	This was a small community associated with the drainage ditch/creek that traversed the property, located south of the SWD2-2. It occupied the slope between the surrounding agricultural fields and the drainage ditch. The dominant canopy species was hawthorn with rare occurrences of oak and American elm. The ground layer consisted of reed-canary grass, goldenrod, and asters.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-Canary Grass Mineral Meadow Marsh	This community was a small pocket of meadow marsh adjacent to the FOD9-1 and surrounded by agricultural fields. A few scattered willow trees grew among a ground layer made up of reed-canary grass, narrow-leaved cattail, and common burdock. There was some surface water over approximately one-quarter of the interior of the community.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T56	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9/SWD Fresh – Moist Oak – Maple – Hickory Deciduous Forest with a Deciduous Swamp Complex	This community was assessed from the edge, but it appeared to be a complex of FOD and SWD, with the swamp containing swamp maple and oak species. Canopy species in the forest consisted of sugar maple, shagbark hickory, swamp maple, and swamp oak. The understory was primarily made up of gray dogwood with lower abundances of choke cherry and nannyberry. Goldenrod, scarlet strawberry and garlic mustard were the most abundant species in the ground layer.
	Cultural (CU)	
	Cultural Woodland (CUW)	
	CUW1 Mineral Cultural Woodland	The average height of trees in this community was 6 to 8 m and the most abundant species were swamp maple, green ash and trembling aspen. The canopy was relatively open at approximately 35 to 45% cover. There was a dense understory of gray dogwood, swamp maple, and narrow-leaved meadowsweet, and a ground layer of Kentucky bluegrass, creeping cinquefoil, scarlet strawberry, and goldenrod.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD3-3 Swamp Maple Mineral Deciduous Swamp	Swamp maple, green ash, and swamp white oak made up the canopy in this mature community. The understory was composed in large part of buttonbush and narrow-leaved meadowsweet, with occasional swamp maple saplings. The buttonbush was densest in areas where surface pools existed, as is typical of such communities. Sensitive fern, northern water horehound, and touch-me-not species made up the ground layer.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This meadow marsh was dominated by reed-canary grass with rare occurrences of goldenrod. It was assessed from the edge of the property boundary.
T57	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-3 Dry-Fresh Sugar Maple – Oak Deciduous Forest	The most abundant canopy species in this community were red oak and sugar maple. The sub-canopy was primarily made up of sugar maple while the remainder was evenly comprised of American beech and red oak. The understory consisted primarily of sugar maple, Millspaugh's blackberry, chokecherry and American beech. Jack in the pulpit, Pennsylvania sedge and big-leaf aster was the most abundant ground vegetation species visible.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1/MAM2-2 Dry-Moist Old field cultural meadow with a Reed-canary Grass Mineral Meadow Marsh inclusion	This community included mainly Grass species, New England aster and Goldenrod species, with less abundance of Wild carrot, Sedge species, Tufted vetch and Sweet-clover species. The Cultural Meadow is bordered by an inclusion of Reed-canary Grass Meadow Marsh along a drainage feature.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	This community was a mature swamp with dense vegetation layers. It was assessed from the roadside. The most abundant canopy species were green ash, swamp white oak, and swamp maple. Gray dogwood, green ash and narrow-leaved meadowsweet were the most abundant understory species, while grasses, impatiens species, and white avens made up the ground cover.
	Thicket Swamp (SWT)	
	SWT2-9 Gray Dogwood Mineral Thicket Swamp	This community had a sparse canopy (<25% cover) of white elm. The ground vegetation consisted of narrow-leaved meadow-sweet, reed canary grass, and spotted touch-me-not. The area receives agricultural drainage input resulting in soil moisture in some locations however there was no surface water observed.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This community had a ground layer dominated by reed-canary grass. There was no surface water present.
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The dominant species in this community was reed canary grass with some glaucous cattail present. The underlying ground layer consisted of awl-fruited sedge, rush spp., with some fox sedge. Shallow pockets of water (<10cm) were present within the community.
T58	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD2-2 Green Ash Mineral Deciduous Swamp	This community was a mature swamp with dense vegetation layers. It was assessed from the roadside. The most abundant canopy species were green ash, swamp white oak, and swamp maple. Gray dogwood, green ash and narrow-leaved meadowsweet were the most abundant understory species, while grasses, impatiens species, and white avens made up the ground cover.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This meadow marsh community was dominated by reed-canary grass, followed by much lower abundances of indian hemp and gray dogwood. This community followed a drainage feature but did not contain any water at the time of the survey.
	Forest (FO)	
	Deciduous Forest (FOD)	
	FOD6-5/SWD2-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp	Dominant species were red and white oak with sugar maple. The sub-canopy consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. Complexed within this community were green ash mineral deciduous swamp.
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This community was a small woodlot located in the center of the property at its northern edge. The dense, mature canopy consisted of sugar maple, red oak, American basswood and an ash species. The moderately thick sub-canopy was dominated by sugar maple with American beech and hop hornbeam. Sugar maple, American beech, and American basswood dominated the understory, while sugar maple, wild red raspberry, and large-leaved aster predominated in the ground layer. The community had undergone some light logging and some old bee boxes were located near the southern edge. Some fire damage was also observed on some stumps and deadfall. A potential vernal pool was located near the western edge of the community.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T59, T60	**Swamp**	
	Mixed Swamp (SWM)	
	SWM2-2 Swamp Maple – Conifer Mixed Swamp	This community was located just inside the interior of the large woodland feature at the eastern end of the property. It appeared to extend northwards onto an adjacent property. The moderately thick canopy was dominated by eastern hemlock and Freeman's maple, with a smaller component of white pine. The sub-canopy was thinner and consisted of hop hornbeam, witch-hazel, and yellow birch. Winterberry and eastern buttonbush were the most abundant understory species, while the ground layer consisted of royal fern, cinnamon fern, and bitter nightshade. The topography was hummocky, with numerous pools of shallow water interspersed throughout. The community had undergone some light logging in the past.
	Thicket Swamp (SWT)	
	SWT2-4 Buttonbush Mineral Thicket Swamp	This was a larger community located near the southeastern corner of the property within the large FOD6-5. A sparse canopy made up of Freeman's maple, hop hornbeam, red oak and eastern buttonbush overtopped a dense sub-canopy dominated by eastern buttonbush. Smaller components of winterberry and highbush blueberry were also observed in the sub-canopy. The ground layer consisted primarily of ferns and sedges. Surface water covered approximately 95% of the area and was at least 60cm deep.
T62, T63	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD3-1 Dry to Fresh Poplar Deciduous Forest	Canopy species occurring in this community included Cottonwood species, Trembling aspen, White Ash, Green Ash, Willow species, Sugar maple, American basswood and Red oak . The sub-canopy included Sugar maple, Trembling aspen and Cottonwood species. The understory was comprised of species such as Staghorn sumac, Spicebush, Sugar maple, Trembling aspen, virginia creeper and Gray dogwood, while the ground layer contained Currant species, Spicebush, Tall goldenrod, Canada goldenrod, Wood nettle, Poison Ivy and Sensitive fern.
	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	The canopy was fairly open at about 60% cover, and consisted of green ash with a smaller component of swamp maple and eastern cottonwood. Most of the large mature trees were green ash and eastern cottonwood. Spicebush, wild red raspberry and common buckthorn made up the dense understory. Ground vegetation was primarily composed of enchanter's nightshade, Virginia creeper, touch-me-not species, and white avens.
	FOD7 Fresh – Moist Lowland Deciduous Forest	Evidence of past logging was observed in this mid-age community, and is expected to have influenced canopy composition, which was quite mixed. Canopy species consisted of swamp maple, paper birch and eastern cottonwood, with swamp maple, green ash, black cherry, and paper birch in the sub canopy. Spicebush and gray dogwood formed the larger part of the understory, while green ash, enchanter's nightshade, and Virginia creeper made up the ground vegetation.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD4-3 White-birch Poplar Mineral deciduous forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.
	SWD2-2 Green Ash Mineral Deciduous Swamp	Canopy species consisted of green ash with smaller components of swamp maple and white elm. Green ash and spicebush made up the relatively sparse understory. The ground layer was dense and consisted of fowl meadow grass, lake-bank sedge, sensitive fern, and beggar-ticks. There was evidence of surface pooling during early to mid-spring but at depths of less than 15cm.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T66, T85, T94	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD1 Dry-Fresh Oak Deciduous Forest Ecosite	Located along the north portion of the deciduous forest/swamp communities along the southern portion of this property. This community is fragmented due to two agricultural fields edged along the outside borders. Canopy cover is approximately 70 percent, with a variable mixture of species within the canopy cover. Trembling aspen, sugar maple, red, white and bur oak, American elm and Freeman's maple were found consistently throughout this community.
	FOD1-1 Dry-Fresh Red Oak Deciduous Forest Type	Upland community with predominantly red oak, white ash and American beech located within the canopy cover. Ground cover was dominated by large-leaved aster. One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics.
	FOD3-1 Dry-Fresh Poplar Deciduous Forest Type	Dominated by trembling aspen, this was an early successional community located along the portion of the hedgerow bordering the west boundary of the property.
	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The dominant canopy species were sugar maple, red oak, and American beech, while the sub-canopy contained sugar maple, hop hornbeam and American beech. The understory consisted mostly of saplings of sugar maple and hop hornbeam. Panicled aster, avens, and raspberry species made up the ground layer. Complexed within this were a few small pockets of red maple mineral swamp.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old Field Meadow Type	Community dominated by grass species, primarily timothy. Areas of reed-canary meadow marsh pockets throughout this community.
	Cultural Thicket (CUT)	
	CUT1-7* Dogwood-White Pine Cultural Thicket	Community assessed along roadside do to restricted property access. Dominated by dogwood species and white pine samplings.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD1-1 Swamp White Oak Mineral Deciduous Swamp Type	This community was assessed from the edge of the agricultural field bordering this community, due to restricted property access. This community had abundant swamp white oak in the canopy cover, with Freeman's maple, red maple, red oak and green ash associates. Deep standing water within this community, with appearances of sensitive fern, blue-flag iris and sedge species within the ground cover.
	SWD2-2a Green Ash Mineral Deciduous Swamp Type	Surrounded shallow marsh community, with various pockets of saturated soil. Pockets of upland forest located along the southern boundary of this community. Dominated by green ash, Freeman's maple and red oak were occasional throughout the canopy cover.
	SWD2-2b Green Ash Mineral Deciduous Swamp Type	Small swamp pocket, located adjacent to the farm road along the hedgerow. Primarily green ash, with swamp oak and American elm associates.
	SWD3-3 Swamp Maple Mineral Deciduous Swamp Type	Dominated by Freeman's maple (swamp maple), other canopy associates include ash species, white pine, willow species and black walnut. This community was assessed along the agricultural field due to deep water, restricting access into community. Dogwood and willow shrubs buffer this community with the agricultural field.
	Thicket Swamp (SWT)	
	SWT2-6 Meadowsweet Mineral Thicket Swamp Type	This shrub-thicket community was dominated by meadowsweet, with occasional dogwood shrub cover. Reed-canary cover was also found throughout this community.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh Type	This community is located throughout this property. Reed-canary grass dominant, occasional appearances of milkweed, meadowsweet and dame's rocket are found primarily bordering these communities.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Shallow Marsh (MAS)	
	MAS2-9a Forb Mineral Shallow Marsh Type	A mixture of species throughout this community. Blue-flag iris, sedge and grass species as well as sensitive fern was observed from the outside edge of this community. Due to large areas of open and pooling water, this community was assessed along the deciduous swamp border, and was located in the center of deciduous swamp community at the south end of the property.
	MAS2-9b Forb Mineral Shallow Marsh Type	A disturbed community situated on old farm road, with large areas of open pockets of water from vehicle use. Various species composition includes chamomile, yellow iris, reed-canary grass, prickly lettuce, cattails and sedge species.
T75	**Swamp (SW)**	
	Deciduous Swamp (SWD)	
	SWT2-2 Willow Mineral Thicket Swamp	This community occurred on an adjacent property at the border of the surveyed property. As there was no access to the adjacent property, a full survey of the community was not completed. Based on a preliminary assessment, the canopy layer consisted of sparse Ash species. The understory was comprised of Willow species and Spiraea species while the ground layer consisted of Reed canary grass and Sedge species.
T76	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD9-1 Fresh – Moist Oak-Sugar Maple –Deciduous Forest	The most abundant canopy species in this community were white oak, red oak, white elm, and sugar maple. The understory consisted primarily of long-spined hawthorn and young sugar maple. Spotted touch-me-not was the dominant ground vegetation, followed by long-spined hawthorn, white ash and sugar maple.
	FOD5-11* Fresh-Moist Sugar Maple-Oak-Beech Deciduous Forest	The most abundant canopy species in this community were sugar maple and white oak in equal proportions and American beech. The understory consisted of sugar maple, long-spined hawthorn, American beech and white oak. Sugar maple saplings were the most abundant ground vegetation along with red raspberry and poison ivy.
T78	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This community was located in the center of the southern edge of the property. Canopy dominants were red oak, sugar maple, Freeman's maple, and green ash. The sub-canopy was made up of sugar maple, hop hornbeam, blue beech, and American beech. Sugar maple, hop hornbeam, and American beech made up a moderately thick understory, and a sparse ground layer consisted mainly of large-leaved aster, sugar maple, and rough goldenrod. The soils were clay dominated and the moisture regime was 5. A drainage ditch ran through the community at its narrowest section. Trails and evidence of logging were observed within the community.
	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Mineral Deciduous Swamp	The primary canopy species were red oak, sugar maple, and American beech with a sub-canopy of American beech, hop hornbeam, and sugar maple. The understory was moderately dense and consisted of American beech, hop hornbeam, and sugar maple. A moderately thick coverage of large-leaved aster, thimble-berry, and rough goldenrod dominated the ground layer. The soils were clay dominated and the moisture regime was 5/6. Complexed within this FOD was a swamp maple mineral swamp community, dominated by Freeman's maple, green ash, and ferns and sedges. Some evidence of disturbance could be seen throughout the site in the form of light logging activities and installation of drainage pipes within areas of the swamp complex.
	Forest (FO)	
	Deciduous Forest (FOD)	
	FOD5-3 Dry – Fresh Sugar Maple – Oak Deciduous Forest	This community was a mature forest with dense vegetation layers. The most abundant species were red oak, sugar maple, and white ash. Choke cherry and gray dogwood made up the understory, while spotted cranes-bill, garlic mustard, and John's cabbage were the most abundant ground vegetation species.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T79, T80	FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest	The canopy of this mature forest extended to heights of over 25m and consisted primarily of shagbark hickory, sugar maple, red oak, and American basswood. Saplings made up a dense understory, consisting of sugar maple, shagbark hickory, and white ash. The ground layer was also dense and composed mostly of sedges, with lower abundances of white avens, large-leaved avens, and creeping cinquefoil. Tractor paths were found within.
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This mid-age forest consisted of sugar maple, shagbark hickory, and a low abundance of swamp white oak in the canopy, with gray dogwood, sugar maple, and choke cherry in the understory. Garlic mustard, enchanter's nightshade, and common speedwell proliferated in the ground layer. The community contained occasional pockets of vernal pool habitat, often with a buttonbush thicket swamp component. Depths of surface water at the time of the survey varied from 3- to 35 cm.
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This mature forest had a tall canopy often reaching over 25m in height. The main components of the canopy were sugar maple, red oak, and American beech. Sugar maple, ironwood, and Millspaugh's blackberry made up the understory. Sugar maple was again abundant in the ground layer, along with false solomon's seal and white trillium. One vernal pool with a water depth of 20cm was located.
	Cultural (CU)	
	Cultural Thicket (CUT)	
	CUT1-4 Gray Dogwood Cultural Thicket	This thicket community had a very sparse canopy of black walnut and white ash above a dense understory of gray dogwood. Ground vegetation consisted of goldenrod, tall fescue, and reed-canary grass.
	Cultural Woodland (CUW)	
	CUW1-3* Ash Cultural Woodland	The canopy of this mid-age community was made up primarily of white ash, bitternut hickory, and american basswood. American ash, hawthorn species, and black walnut formed the dense sub canopy and understory layers. Trees were mostly at or under 10cm diameter, with larger sizes becoming increasingly rare. The ground vegetation was also dense, consisting of goldenrod, knapweed and grasses
	Cultural Meadow (CUM)	
	CUM1 Mineral Cultural Meadow	This community is found throughout the study area, ranging from low to high levels of disturbance. A variety of species were observed within these communities, and include (but not limited to) goldenrods, asters, dandelions, and several grass species.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The dense canopy of this mature swamp was composed mainly of swamp maple, shagbark hickory, green ash, and sugar maple. The shrub layer also consisted mainly of saplings of swamp and sugar maple, with a smaller component of common elderberry. Touch-me-not, sedges, fowl meadow grass, and sensitive fern were the most prevalent ground species and formed a dense layer. Some pockets of deep, saturated organic soil were found throughout.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-11* Common Reed Mineral Meadow Marsh	This marsh consisted of a dominant layer of common reed, with occasional occurrences of reed-canary grass, and rarely occurring cattail species, beggar-ticks, and European stinging nettle. Surface water was confined to the perimeter of the marsh at a depth less than 15cm.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T81	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.
	FOD5-4 Dry-Fresh Sugar Maple-Ironwood Deciduous Forest	The canopy in this forest is composed of sugar maple, red oak, bur oak and shagbark hickory. The sub-canopy is dominated by ironwood with very few white elm occuring close to feature edge. Understory vegetation is comprised of white ash and blue beech with rarely witchhazel. the ground layer was sparse, consisting of mainly grasses and young trees. Community likely disturbed by grazing in the past.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old field cultural meadow	This small community adjacent to the northern property boundary, was an open community typical of other CUM1-1 communities in the study area. Typical ground vegetation consists of grasses and forbs, and those most commonly observed include goldenrods, panicled-aster, scarlet strawberry, and wild carrot.
	Swamp (SW)	
	Thicket Swamp (SWT)	
	SWD3-3 Swamp Maple Mineral Deciduous Swamp	This swamp community consisted of a canopy layer dominated by Freeman's maple with white elm as an occasional associate. Southern arrow-wood, common elderberry, marsh rose, and Alleghany blackberry, among others, made up the shrub layer, while the ground layer consisted of species such as spotted touch-me-not, soft rush, devil's beggar-ticks, and marsh bedstraw.
	SWT3-4 Buttonbush Organic Thicket Swamp	This thicket swamp community consisted predominantly of buttonbush, with red maple and American elm associates on organic soil. Dogwoods and raspberry were located throughout this community. The groundlayer consisted of various grass species, reed canary grass, goldenrods and sedge species.
	Thicket Swamp (SWT)	
	SWT2-4 Buttonbush Mineral Thicket Swamp	This community occurred in two locations along the property boundary, the understory is composed of buttonbush in much higher proportions than meadowsweet, which is also a component. The ground layer is heavily dominated by lakebank sedge, with smartweed species and woolgrass also occuring.
	SWT2-6 Meadowsweet Mineral Thicket Swamp	This community had a canopy composed mainly of narrow-leaved meadowsweet and grey dogwood. Due to the density of the canopy layer, no other species were present in the understory or ground layer.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2 Mineral Meadow Marsh	These mineral meadow marsh communities were generally dominated by reed canary grass and soft rush, with rare to occasional occurrences of fox sedge, awl fruited sedge, and various other sedges and grasses. The northeastern-most community differed, consisting of a monoculture of tall manna grass.
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	These small meadow marsh communities consisted of reed canary grass with occasional occurrences of soft rush and, more rarely, a sedge species. Surface water was strictly ephemeral and would not persist into the summer.
	MAM2-6 Broad-leaved sedge Mineral meadow-marsh	This small broad-leaved sedge meadow marsh consisted of an open monoculture of lake-bank sedge

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T83, T88	**Cultural (CU)**	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old Field Meadow Type	Found throughout this property, this community is dominated by reed-canary grass. Reed-canary grass was the sole vegetation species within this community.
	Swamp	
	Thicket Swamp (SWT)	
	SWT2-2 Willow Mineral Thicket Swamp Type	Due to property access, this community was assessed from property boundary. Willow shrub species dominated this community.
	SWT2-13* Dogwood Mineral Thicket Swamp Type	Due to property access, this community could not be identified down to species level. Dogwood species dominate this community.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Minearal Meadow Marsh Type	Found throughout this property, this community is dominated by reed-canary grass. Reed-canary grass was the sole vegetation species within this community.
	Shallow Marsh (MAS)	
	MAS2-1 Cattail Mineral Shallow Marsh Type	Located along a drainage feature adjacent to the disturbed residential area and cultural meadow community, narrow-leaved cattail dominate this community. Small areas of standing water.
T82	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-1 Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest Type	The canopy species found in this community were sugar maple, white ash, and Scots pine. A sub-canopy was absent due to the canopy having a cover density (>60%). The understory consisted primarily of poison ivy, wild red raspberry, Virginia creeper and a currant/gooseberry species. Garlic mustard was the most abundant ground vegetation species visible, followed by wood nettle and spotted touch-me-not.
	Cultural (CU)	
	Cultural Meadow (CUM)	
	CUM1-1 Dry – Moist Old Field Meadow Type	This community had no canopy or sub-canopy present. The understory consisted primarily of wild red raspberry, poison ivy and grey dogwood, while the ground layer consisted of a goldenrod species, sensitive fern and garlic mustard.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2(a) Reed-canary Grass Mineral Meadow Marsh Type	This community had a canopy made up entirely of Manitoba maple. No sub-canopy was present. The understory was made up of white elm and green ash, while the ground layer consisted of reed-canary grass, sensitive fern, spotted touch-me-not and a horsetail species.
	MAM2-2(b) Reed-canary Grass Mineral Meadow Marsh Type	This canopy species in this community consisted of green ash and trembling aspen, while the sub-canopy was exclusively made up of Manitoba maple. The understory consisted of trembling aspen and staghorn sumac, while the ground layer was mainly reed-canary grass, broad-leaved cattail and various species of sedges and goldenrod.
T84	**Cultural (CU)**	
	Cultural Plantation (CUP)	
	CUP3 Coniferous Plantation	The dominant canopy species was young to mid-age spruce trees with a much smaller component of young sugar maple trees scattered throughout. Since it was a young community, canopy cover was more open than is typically seen in coniferous plantations. Ground vegetation was profuse and was dominated by short grasses with occasional occurrences of panicled asters and new-england asters throughout.
	Cultural Meadow (CUM)	
	CUM Cultural Meadow	This community is found throughout the study area, ranging from low to high levels of disturbance. A variety of species were observed within these communities, and include (but not limited to) goldenrods, asters, dandelions, and several grass species.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Swamp	
	Thicket Swamp (SWT)	
	SWT2-2 Willow Mineral Thicket Swamp	This community was a larger patch towards the western edge of the CUP and consisted of young willow shrubs (under 2m in height) and less common occurrences of nannyberry. The ground vegetation contained a mix of goldenrod species, purple loosestrife, and grasses. No surface water was observed.
T89	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-2 Dry – Fresh Sugar Maple – Beech Deciduous Forest	This forest consisted mainly of sugar maple and American beech in the canopy and sugar maple, American beech, and hop-hornbeam in the subcanopy. American beech was very abundant in the understory, along with sugar maple and hop-hornbeam. Other shrubs included occasional occurrences of maple-leaved viburnum and witch-hazel. The ground layer was dense, consisting primarily of Virginia creeper, wild lily-of-the-valley, and large-leaved aster. Soils consisted of sandy loam with no mottling or gley visible up to 120cm.
	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	Sugar maple and swamp maple were the most abundant canopy species, followed by white elm and yellow birch. Spicebush was the most abundant understory species, while the ground layer was dominated by Virginia creeper, poison ivy, sensitive fern, and rough goldenrod.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD3-3 Swamp Maple Deciduous Swamp	Swamp maple was the most abundant canopy species in this community, followed by much less frequent occurrences of green ash and white elm. Spicebush, swamp maple, and green ash were the most abundant understory species. The ground vegetation consisted primarily of marsh fern, sedges, and fowl meadow grass. Soil was saturated in a few areas but no surface water was present; however, signs of seasonal pooling of up to 30cm depth were observed.
T93	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-2a Dry-Fresh Sugar Maple – American Beech Deciduous Forest Type	This community was upland, with dry soils and no areas of standing or pooling water. Dominated by sugar maple and American beech, various canopy associates including trembling aspen, shagbark hickory, ironwood and black cherry occurred throughout. Blue cohosh, nettles, wild ginger and goldenrods occurred throughout the ground layer.
	FOD5-2b Dry-Fresh Sugar Maple – American Beech Deciduous Forest Type	This community was upland, with dry soils and no areas of standing or pooling water. Dominated by sugar maple and American beech, with little to no associates occurring within the canopy. True Solomon's seal, blue cohosh, poison ivy and garlic mustard occurred throughout the ground layer.
	Cultural (CU)	
	Cultural Plantation (CUP)	
	CUP3-3 Scotch Pine Coniferous Plantation Type	Bordering the residence along Concession 4, this community was dominated by scotch pine, with some white pine. A shrub layer forming under the canopy of grey dogwood covers less than 25% of this community.
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old Field Meadow Type	This community type occurred throughout this property. East, adjacent to the property line, a large cultural meadow stretched from the road, back towards the deciduous forest. This community reappeared west of the residence, as well as west to the adjacent property. Orchard grass and reed-canary grass dominated this community throughout. A pond was located between this community and the residence.
	Cultural Woodland (CUW)	
	CUW1-3* Green Ash-Freeman's Maple Cultural Woodland Type	Planted deciduous woodland adjacent to the residence. Rows of only green ash and Freeman's maple, with a high grass ground layer of orchard grass and soft brome.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
	Swamp	
	Thicket Swamp (SWT)	
	SWT2-6 Meadowsweet Mineral Thicket Swamp Type	Separated a sugar maple-beech deciduous forest, this swamp thicket community was dominated by meadowsweet. Very difficult to walk through due to high density vegetation.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2-2 Reed-canary Grass Mineral Meadow Marsh Type	Located along the north section of the property, bordering the road and hedgerow communities. Dominated by reed-canary grass, this feature follows along with the drainage areas on this property.
T95	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	Sugar maple, American beech, and red oak made up the canopy in this forest community, with American beech and hop-hornbeam abundant in the sub-canopy. The understory and ground vegetation layers were relatively thin, consisting of Alleghany blackberry with maple-leaved viburnum in the shrub layer, and Canada mayflower, sessile-leaved bellwort, and large-leaved aster in the herb layer.
	Swamp (SW)	
	Deciduous Swamp (SWD)	
	SWD 3-1 Red Maple Mineral Deciduous Swamp	Red maple dominated this swamp, along with a smaller proportion of American ash; the woody understory was primarily composed of thimble-berry and witch-hazel. A diverse mix of species occurred in the ground layer, including woodland sedge, graceful sedge, and rough bedstraw.
	Marsh (MA)	
	Meadow Marsh (MAM)	
	MAM2 Mineral Meadow Marsh	This open meadow marsh community consisted mainly of reed canary grass, but contained associates of red-footed spike rush, cursed buttercup, and a smartweed species. This community was located in a previously actively-used agricultural field and thus had established relatively recently in the now fallow field.
	Shallow Marsh (MAS)	
	MAS2-1 Cattail Mineral Shallow Marsh	This shallow marsh community consisted of a dense ground layer of narrow-leaved cattail, overtopped by a sparse canopy of sandbar willow.
T96	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD3-1 Dry-Fresh Polar Deciduous forest	Canopy cover was relatively open in this young community and was dominated by trembling aspen and green ash with some white birch and sugar maple. The understory consisted primarily of staghorn sumac with occasional willow shrub species and prickly ash, goldenrod, daisy fleabane and grasses were the dominant ground vegetation. This vegetation community was highly disturbed, with evidence of recreational use including a trailer, shed, chairs and mown areas and trails throughout.
	Cultural	
	Cultural Meadow (CUM)	
	CUM1-1 Dry-Moist Old Field Meadow	This Community was dominated by Goldenrods and reed canary grass in the ground layer. Other species present include timothy grass, horsetail species and garlic mustard.
	Swamp	
	Deciduous Swamp (SWD)	
	SWD 2-2 Green Ash Mineral Deciduous Swamp	Surveyed from the edge of the property, this community was dominated by green ash in the canopy, with silver maple and trembling aspen. The understory vegetation was dominated by poison ivy, with spicebush and speckled alder also present. Ground vegetation included Sensitive fern, sedges and jewelweed as the dominant species.

Table 4.4 ELC for Turbines and Access Roads

Location	ELC Type	Community Description
T97	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	This community is found within the Beaver Creek PSW Complex to the southwest of the proposed turbine location. The canopy of this community is strongly dominated by sugar maple with much smaller numbers of swamp white oak and red maple also present. The sparse understorey is dominated by alder-leaved buckthorn followed by witch hazel and red maple saplings. Ground cover vegetation is dominated by wild sarsaparilla, twisted stalk, swamp dewberry and smooth blackberry.
T98	**Forest (FO)**	
	Deciduous Forest (FOD)	
	FOD Deciduous Forest	This community is dominated by deciduous tree canopy cover, and was located throughout the project location. Characteristics of this forest community include conopy cover >60%. Dominance of tree species are variable.
	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	The most abundant canopy species in this community were green ash and Eastern cottonwood with a sub-canopy comprised of green ash, white elm, white birch and trembling aspen. The understory consisted primarily of silky dogwood, gray dogwood, buckthorn and nannyberry. The ground layer was made up of virginia creeper, poison ivy, a species of avens, and spotted touch-me-not. There was a low lying area within this feature that appeared to have been inundated with water in the past, though there was no surface water present during this visit.
	Cultural (CU)	
	Cultural Woodlot (CUW)	
	CUW 1-3* Scots Pine Cultural Woodland	This community was a cultural Scots pine planation with some Eastern cottonwood contributing to the canopy. The sub canopy was made up of white elm and Manitoba maple. The understory consisted of silky dogwood and grey dogwood with some common buckthorn and nannyberry present. The ground vegetation consisted mostly of wild red raspberry, poison ivy and spotted touch-me-nots. It was noted that many of the Scots pines were unhealthy and dying with several snags present. There was water within this feature.

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
Forest (FO)		
Coniferous Forest (FOC)		
FOC2-2 Dry-Fresh White Cedar Coniferous Forest	This community was dominated by Eastern white cedar with some instances of white pine in the canopy. Ground vegetation was absent.	1
Mixed Forest (FOM)		
FOM2-2 Dry to Fresh White Pine-Sugar Maple Mixed Forest	Freeman's maple is the dominant canopy cover in this community, Eastern cottonwood, sugar maple and white pine are common associates. Subacanopy species include trembling aspen and norway spruce, The understory is sparse and includes white spruce and staghorn sumac. Ground cover is dominated by goldenrod species and rivrbank grape.	1
FOM8-1 Fresh-Moist Poplar Mixed Forest	Trembling aspen dominated this community with some scots pine as an associate. Understory vegation included staghorn sumac and riverbank grape. Ground cover was not identifiable.	1
Deciduous Forest (FOD)		
FOD - Deciduous Forest	The edge of this deciduous forest was inventoried from South Grimsby Road 3. A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	2
FOD2 Dry-Fresh Oak-Maple-Hickory Deciduous Forest	The edge of this deciduous forest is approximately 75 metres from South Grimsby Road 3. Red Oak is dominant in the canopy. Basswood is abundant in the canopy and sub-canopy. Shagbark Hickory occurs occasionally in the canopy and sub-canopy. The outer edge of the forest is composed of immature Trembling Aspen, White Ash and Sugar Maple, as well as Riverbank Grape, Staghorn Sumac and Gray Dogwood. The ground layer of this forest community was not visible due to distance.	1
FOD2-2/SWD2-2 Dry-Fresh Oak-Hickory Deciduous Forest Complex with Green Ash Mineral Decidous Forest	Red oak was the dominant canopy cover in this communitiy, with Bur oak, green ash and shagbark hickory associates. The subcanopy included red oak, green ash and shagbark hickory, with an understory dominated by green ash, white elm and shagbark hickory saplings. Ground cover was not observed in this community.	1
FOD2-4 Dry-Fresh Oak Hardwood Deciduous forest	Dominated by red oak in the canopy along with Bur oak and black walnut associates. Red oak and Beech dominated the sub canopy, and grasses and Canada goldenrod dominated the ground layer.	1
FOD3-1 Dry to Fresh Poplar Deciduous Forest	Tembling aspen is the dominant vegation in the canopy, sub-canopy and understory in this community. Ground cover included goldenrod species and phragmites.	2
FOD4 Dry-Fresh Deciduous Forest	Dominated by Bur oak and American Beech along with other unidentifiable deciduous species.	1
FOD4-1 Dry to Fresh Beech Deciduous Forest	Dominated by Beech with other deciduous species including white ash present. The ground layer included Canada goldenrod and species of grasses and riverbank grape.	2
FOD4-2 Dry-Fresh White Ash Deciduous Forest	This community was dominated by white ash in the canopy and subcanopy, other associates included red oak, white oak and trembling aspen. Understory vegation included riverbank grape, the ground layer was not visible during the survey.	1
FOD5 Dry-fresh Sugar Maple Deciduous Forest	Dominated by sugar maple, with occasional basswood and swamp maple.	1

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest	The community occupies a tableland near the roadside and a downward slope to the east. Sugar maple was the dominant canopy species, followed by basswood, and a smaller component of white ash. The sparse sub-canopy appeared to consist exclusively of sugar maple. The understory was also thin and contained young sugar maple and black cherry. Common ground layer species were zig-zag goldenrod, aster species and grasses.	1
FOD5-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest	This community was dominated by sugar maple in the canopy with abundant american Beech, and ocassional to abundant hemlock and red maple. The understory included spicebush, riverbank grape and blue beech. No ground cover was apparent during the survey due to a high volume of leaf litter.	2
FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous forest	This community was dominated by white ash, sugar maple and basswood in the canopy. Grasses were the most prevalent in the ground layer.	1
FOD5-10 Dry to Fresh Sugar Maple-White Birch-Poplar Deicuous Forest	This community was dominated by Eastern cottonwood in the canopy with sugar maple as an associate. The subcanopy was dominated by sugar maple with trembling aspen and scots pine occuring regularly. Understory vegetation consisted of raspberry species and hawthorn. with goldenrod and reed canary grass in the ground layer.	1
FOD6 Fresh-Moist Sugar Maple Deciduous Forest	This community is dominated by sugar maple in the canopy and the understory. Occasional Black walnut and green ash are also present.	4
FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	4
FOD7-1 Fresh to Moist American Elm Deciduous Forest	White elm is the dominant canopy cover in this community, with trembling aspen and green ash as common associates. The sub-canopy is dominated by white elm and green ash is also common. The understory includes riverbank grape and white elderberry, with goldenrod species dominating the ground layer.	1
FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This community is dominated by Green ash and American elm in the canopy. Understory vegation includes Gray dogwood and hawthorn species. The ground layer is dominated by common milkweed and goldenrod species.	3
FOD7-4 Fresh-Moist Lowland Black Walnut Deciduous Forest	Dominated entirely by black walnut in the canopy.	3
FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	This community is dominated by willow trees in the canopy and is associated with riparian zones and creeks throughout the study area.	5
FOD7-4/FOD6 Fresh-moist Black Walnut Lowland Deciduous Forest complex with Fresh-Moist Sugar Maple Deciduous Forest	This Community occurred on a gentle slope, with Sugar maple occurring higher on the slope, and lower slopes almost entirely dominated by black walnut.	1
FOD7-6* Fresh-Moist Manitoba Maple – Ash Lowland Deciduous Forest	The canopy was made up of young to mid-age Manitoba maple and ash, with an understory consisting of Manitoba maple, ash and grape vine. The ground layer was dominated by grape vine and panicled aster. The community was confined to the banks of a stream running between residential and agricultural land uses, and some evidence of past logging was apparent.	1
FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.	5

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
FOD8-3* Fresh to Moist Eastern Cottonwood Deciduous Forest	This small community is dominated by Eastern cottonwood in the canopy, with trembling aspen and white elm associates. The sub-canopy was dominated by staghorn sumac, riverbank grape also occurred. The ground layer included species of goldenrods and burdock.	1
FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.	5
FOD9 Fresh-Moist Bur Oak Deciduous Forest	These communities are dominated by variable mixtures of Shagbark hickory, Basswood, bur oak, sugar maple white oak and beech with black locust, shagbark hickory, bur oak and sumac in the understory. Ground cover included Canada goldenrod and grasses.	10
FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	7
FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.	8
FOD9-3 /FOD7-2 Fresh-Moist Bur Oak Deciduous Forest complex with Fresh-Moist Lowland Ash Deciduous Forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.	2
FOD9-4 Shagbark Hickory Deciduous Forest	The edge of this deciduous forest was inventoried from Walker Road. The canopy and sub-canopy are dominated by Shagbark Hickory. Bur Oak is abundant in the sub-canopy and occasional in the understory. Gray Dogwood, Hawthorn and Prickly Ash are abundant at the outer edge of the forest. The ground layer of this forest community was not visible due to the thick understory shrubs at the edge of the forest.	1
Cultural (CU)		
Cultural Plantation (CUP)		
CUP1-1 Sugar maple Dedicuous Plantation	This community is dominated by sugar maple, ground cover has been mown and is unidentifiable.	1
CUP1-3 Black Walnut Deciduous Plantation	This plantation was dominated by mature black walnut, with rarely occurring sugar maple in the canopy. Ground cover was obstructed by residences.	3
CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	2
CUP3-1 Red Pine Coniferous Plantation	This community included a plantation of red pine which was unmaintained, other species present included white spruce, white pine and green ash.	2
CUP3-2 White Pine Coniferous Plantation	Dominated by white pine, no ground cover is present in this community.	5
CUP3-3 Scotch Pine Cultural Plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.	2
CUP3-8 White Spruce-European Larch Coniferous Plantation	This plantation community was dominated by white spruce.	2

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
CUP3-12* Mixed spruce coniferous plantation	This plantation community was dominated by a mix of blue, norway and white spruce of varying age classes.	1
Cultural Meadow (CUM)		
CUM1-1 Dry-Moist Old Field Meadow	This community, found throughout the study area, is generally dominated by a variable mix of grass species with Goldenrod and common milkweed. Occasional instances of hawthorn and gray dogwood are also found in some communities.	44
Cultural Thicket (CUT)		
CUT 1 Mineral Cultural Thicket	Various shrub species dominate in this community.	7
CUT1-1Sumac Cultural Thicket	Staghorn sumac is the dominant canopy cover in this community. Occasionally, poplar species and black walnut was present in the canopy and ground cover is dominated by goldenrod species and teasel.	5
CUT1-4 Gray Dogwood Cultural Thicket	This community type is dominated by Gray dogwood in the understory with some hawthorn. Goldenrod and grasses make up the ground layer in these communities.	5
CUT1-7*Tartarian Honeysuckle Cultural Thicket	Dominated by Tartarian honeysuckle in the understory layer, with some gray dogwood. The ground layer is dominated by Canada goldenrod, grasses and riverbank grape.	1
CUT1-10* Common buckthorn-Hawthorn Cultural Thicket	This community occurs in an old pasture community. The canopy includes rare green ash and sugar maple, with an understory dominated by common buckthorn and hawthorn, with ocassional gray dogwood. The ground layer is dominated by grass species, with goldenrod species and new england aster.	1
Cultural Savannah (CUS)		
CUS1-4* Ash Cultural Savannah	This young community with approximately 30% tree cover is dominated by green ash in the canopy with bur oak and white spruce associates. The ground layer was dominated by grasses, goldenrods and common milkweed.	1
Cultural Woodland (CUW)		
CUW1 Mineral Cultural Woodland	This small cultural woodland included scots pine and freeman's maple in the canopy, no understory vegetation was observed. Ground vegetation included Reed canary grass and goldenrod species.	1
CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	2
CUW1-4*Green Ash Mineral Cultural Woodland	Green ash dominates this community in the canopy and the understory with less than 60% cover. Riverbank grape, reed canary grass and goldenrod are present in the ground layer.	2
CUW1-5* Bur Oak Mineral Cultural Woodland	This community is dominated by bur oak in the canopy with black walnut and bur oak in the sub canopy, ground cover includes teasel, goldenrods and grasses.	1
CUW1-6*Black Walnut-Green Ash Mineral Cultural Woodland	This community included a canopy cover of black walnut and green ash, with gray dogwood and riverbank grape occupying the understory. Ground vegetation includes cattails, goldenrods and wild teasel.	1
CUW1-7* Bur Oak-Shagbark Hickory Cultural Woodland	This community is dominated by Bur oak and shagbark hickory in the canopy, with gray dogwood in the understory. Ground cover is dominated by goldenrods and grasses.	1
CUW1-8* American Elm-Green Ash Cultural Woodland	This community is dominated by American elm and green ash in the canopy. Understory vegation includes Gray dogwood and apple species. The ground layer is dominated by common milkweed, oxeye daisy and goldenrod species.	1

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
CUW1-9* Silver Maple Cultural Woodland	This community is heavyly managed and adjacent to a residence which has mown along the edges of the community. Dominant species in the canopy include silver maple with bur oak and white elm associates. Understorey vegetation includes riverbank grape and gray dogwood. The ground layer included Reed canary grass, other grass species and goldenrod species.	1
CUW1-10* Poplar Cultural Woodland	Eastern cottonwood and trembling aspen dominate in this young community in both the canopy and the understory. Associates of white birch and staghorn sumac are also present. The ground layer is dominated by goldenrods, queen anne's lace and common milkweed.	1
Swamp		
Deciduous Swamp (SWD)		
SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this coomunity, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	16
SWD2-2/SWT2 Green Ash Mineral Deciduous Swamp/Mineral Thicket Swamp	Green ash was the dominant canopy cover in the treed portion of this community, white spruce and eastern white cedar also occurred in small pockets throughout. White elm and red maple also occurred in the canopy. The understory included a varied mix of shrub species including silky dogwood, gray dogwood and narrow-leaved meadowsweet, all species appeared to occur in relatively equal propoprtions. Ground vegetation was not observed within the community.	1
SWD3 Maple Mineral Swamp	This small community included a variable mix of canopy species including freeman's maple and red maple, along with white elm, green ash and sugar maple. Understory vegetation included glossy buckthron rarely. Ground vegetation was not observed.	1
SWD3 /FOD6-5 Maple Mineral Swamp complex with Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	This community is dominated by a variable mix of red oak, bur oak and silver maple. Sugar maple is also present as an associate. Understory vegetation includes gray dogwood and virginia creeper.	1
SWD3-1 Red maple Mineral Deciduous Swamp	Red maple is the dominant canopy species in this community, green ash, American elm and trembling aspen are common associates. The sub-canopy composition is the same. Understory vegetation included American elm, common buckthorn and riverbank grape. The ground layer is dominated by golden rod species and sensitive fern.	1
SWD3-2 Silver Maple Mineral Deciduous Swamp	This community is dominated by silver maple in the canopy with green ash and oak associates. Understory species were restricted to inclusion sites and otherwise sparse, species included buttonbush,high-bush blueberry and high-bush cranberry. Ground-cover was dominated by Reed-canary grass and sensitive fern, overall cover of these species was low.	4
SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.	2
Thicket Swamp (SWT)		
SWT2-2 Willow Mineral Thicket Swamp	This community is dominated by understory vegetation layer of willow shrub species. Ground cover is dominated by Reed canary grass.	1
SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.	7
SWT2-4/MAS2-1 Buttonbush mineral Thicket Swamp/Cattail Mineral Shallow Marsh	This small community is dominated by a mix of buttonbush and Cattails, occuring in similar proportions. Bur oak occurs rarely in the canopy and ground vegetation included abundant lakebank sedge.	1

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
SWT2-6 Meadowsweet Mineral Thicket Swamp	This community is dominated by understory vegetation of meadowsweet, with gray dogwood as an associate. Some canopy cover Is present and incuded ocasional green ash and bur oak. Ground cover includes Reed canary grass, jewelweed and sedge species.	3
SWT2-9 Gray Dogwood Mineral Thicket Swamp	Gray dogwood dominates the understory in this community. Canopy species are rare to ocassional and include bur oak, white elm and shagbark hickory.	4
Marsh (MA)		
Meadow Marsh (MAM)		
MAM2 Mineral Meadow Marsh	Dominated by grasses, sedges and goldenrods with some black walnut and ash in the canopy occasionally.	5
MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.	78
MAM2-6 Broad-leaved sedge Mineral Meadow-Marsh	This community is dominated by Lakebank sedge in the ground layer, with associates of cattail and Reed canary grass. Understory species were ocassional and included gray dogwood and narrow-leaved meadowsweet.	1
MAM2-2/MAS2-1 Reed Canary Grass Mineral Meadow Marsh Complex with Cattail Mineral Shallow Marsh	This community is dominated by the ground layer, and includes a variable mix of Reed Canary grass, cattails and Bur-reed species. Willow shrubs are rarely present in the understory.	9
MAM2-2/SWT2-4 Reed Canary Meadow Marsh/ Buttonbush Mineral Swamp Thicket	This community is dominated by equal proportions of buttonbush and reed canary grass. Likely a remnant of a larger community, it occurs within a wide Hedgerow community. Willow ocassionally occurs in the canopy.	1
MAM2-2/CUM1-1 Reed Canary Grass Mineral Meadow Marsh complex with Dry to Moistold Field Meadow	This community is dominated by reed canary grass, goldenrods and common milkweed in the ground layer. Gray dogwood is ocassionally present in the understory with American elm occuring rarely in the canopy.	7
Shallow Marsh (MAS)		
MAS2 Mineral Shallow Marsh	This community is dominated by various grass species with cattail and wild teasel also present.	5
MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.	50
MAS 2-9 Forb Mineral Shallow Marsh	This community is dominated by various species of forb, including canada goldenrod, tufted vetch, wild teasel, white panicled aster and common water plantain. Grasses are also abundant.	1
MAS2-10* Common Reed Grass Mineral Shallow Marsh	This community is a monoculture of Common Reed grass.	4
Shallow Water (SA)		
Floating leaved Shallow Aquatic (SAF)		
SAF1-1 Waterliliy-Bullhead Lily Floating leaved Shallow Aquatic	This community is dominated by Bullhead lily and unidentified submergents.	1

Table 4.5 ELC for Collector Lines and Transmission Lines

ELC TYPE	COMMUNITY DESCRIPTION	NUMBER OF OCCURENCES
Cliff (CL)		
Open Cliff (CLO)		
CLO1 Carbonate Open Cliff Ecosite	This community generally runs in a north-south direction between the TAT1-7* and the FOD5-8 in the Mountainvew Conservation Area. The height of the cliff varied from 3m to 10m across its length and was primarily covered with moss and herbaceous species. Some smaller areas where the cliff face has undergone more fracturing had a higher predominance of shrubs and younger trees. The dominant species were grasses, celandine, garlic mustard and herb-robert. The most commonly observed woody species were red raspberry, grape vine, and young American basswood. A portion of the Bruce Trail crosses this community.	1
Talus (TA)		
Treed Talus (TAT)		
TAT1-7* Fresh-Moist Black Maple Carbonate Treed Talus	The dominant canopy species in this community was mature black maple, followed by smaller proportions of American basswood and ash species. The generally open understory consisted of spicebush and red-berried elderberry. The ground layer was dominated by blue-cohosh, Goldie's fern, and herb-robert. Other commonly encountered species included Virginia waterleaf, grasses, zig-zag goldenrod, and wild ginger. The substrate is dominated by coarse rocky debris and thin soils, with more accumulating in deeper crevices. No detailed soil sampling could be carried out due to the nature of the substrate. A portion of the Bruce Trail crosses through this community.	1

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we1	0.69	FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	The canopy in this community was dominated by Green ash, with Red maple and sparse White elm and Trembling aspen. Green ash and White elm were the most abundant species in the sub-canopy, with infrequent occurrences of Red maple and Trembling aspen. The understory included Green ash, White elm, Staghorn sumac and Nannyberry, while the ground layer was largely Sensitive fern with Canada and Tall goldenrods and Raspberry species. An inclusion of a Cattail Mineral Shallow Marsh was identified within the above community.
we4	94.76	FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.
		FOD9-3 Fresh-Moist Bur oak Deciduous forest complex	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen.
		MAM2 Mineral Meadow Marsh	Dominated by grasses, sedges and goldenrods with some black walnut and ash in the canopy occasionally.
we5	0.87	SWT2-9 Grey Dogwood Mineral Thicket Swamp	The canopy of this community included occasional willow trees, bur oak, shagbark hickory, white elm, green ash and cottonwood. The understorey of this community was dominated by grey dogwood, with lesser components of American elm and narrow leaved meadowsweet. The ground cover included species such as reed canary grass, bedstraw species, sedge species, rough goldnerod, avens species, riverbank grape and a horsetail species.
we6	4.23	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we15	15.76	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SAF1-1 Waterliliy-Bullhead Lily Floating leaved Shallow Aquatic	This community is dominated by Bullhead lily and unidentified submergents.
		FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		MAM/CUM1-1 Mixed Marsh with a complex of Meadowsweet Mineral Thicket Swamp with a Dry-Moist Old field cultural meadow inclusion	This community type was variable in terms of species composition, with no dominance of either forbs or graminoids. Rushes, new-England aster, willow herb, and a smartweed species were the dominant species growing in mixed patches. There was a narrow-leaved meadow-sweet thicket swamp complexed throughout the community along with a dry-moist old field inclusion.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we19	6.19	FOD5-3 Dry – Fresh Sugar Maple – Oak Deciduous Forest	This community was a mature forest with dense vegetation layers. The most abundant species were red oak, sugar maple, and white ash. Choke cherry and gray dogwood made up the understory, while spotted cranes-bill, garlic mustard, and John's cabbage were the most abundant ground vegetation species.
		MAM2-11* Common Reed Mineral Meadow Marsh	This marsh consisted of a dominant layer of common reed, with occasional occurrences of reed-canary grass, and rarely occurring cattail species, beggar-ticks, and European stinging nettle. Surface water was confined to the perimeter of the marsh at a depth less than 15cm.
we20	0.63	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we24	14.81	FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest	This mid-age forest consisted of sugar maple, shagbark hickory, and a low abundance of swamp white oak in the canopy, with gray dogwood, sugar maple, and choke cherry in the understory. Garlic mustard, enchanter's nightshade, and common speedwell proliferated in the ground layer. The community contained occasional pockets of vernal pool habitat, often with a buttonbush thicket swamp component. Depths of surface water at the time of the survey varied from 3- to 35 cm.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The dense canopy of this mature swamp was composed mainly of swamp maple, shagbark hickory, green ash, and sugar maple. The shrub layer also consisted mainly of saplings of swamp and sugar maple, with a smaller component of common elderberry. Touch-me-not, sedges, fowl meadow grass, and sensitive fern were the most prevalent ground species and formed a dense layer. Some pockets of deep, saturated organic soil were found throughout.
we25	15.32	MAM2-2 Reed-canary Grass Minearal Meadow Marsh Type	Found throughout this property, this community is dominated by reed-canary grass. Reed-canary grass was the sole vegetation species within this community.
		MAS2-1 Cattail Mineral Shallow Marsh Type	Located along a drainage feature adjacent to the disturbed residential area and cultural meadow community, narrow-leaved cattail dominate this community. Small areas of standing water.
		MAS2-9 Forb mineral shallow marsh	Dominated by various forb species including canada goldenrod, tufted vetch, wild teasel, white panicled aster, a lemna sp., grasses, reed canary grass, sedge species, blue flag iris, and water plantain.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		SWT2-13* Dogwood Mineral Thicket Swamp Type	Due to property access, this community could not be identified down to species level. Dogwood species dominate this community.
we26	3.71	FOD2-2/SWD2-2 Dry-Fresh Oak-Hickory Deciduous Forest Complex with Green Ash Mineral Decidous Forest	Red oak was the dominant canopy cover in this communitiy, with Bur oak, green ash and shagbark hickory associates. The subcanopy included red oak, green ash and shagbark hickory, with an understory dominated by green ash, white elm and shagbark hickory saplings. Ground cover was not observed in this community.
we28	1.15	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we34	0.90	FOD2-2/FOD7-2 dry-fresh oak-hickory deciduous forest complex with fresh-moist lowland ash deciduous forest	bur oak, red oak and white oak dominated this community in a variable mixture. Shagbark hickory and sugar maple were also present and were the dominant component of the understory. Ground cover included species of Goldenrod.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we37	0.66	FOD9-3 /FOD7-2 Fresh-Moist Bur Oak Deciduous Forest complex with Fresh-Moist Lowland Ash Deciduous Forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.
we41	5.75	FOD9-3 /FOD7-2 Fresh-Moist Bur Oak Deciduous Forest complex with Fresh-Moist Lowland Ash Deciduous Forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.
we47	1.64	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we50	40.16	FOD9/SWD Fresh – Moist Oak – Maple – Hickory Deciduous Forest with a Deciduous Swamp Complex	This community was assessed from the edge, but it appeared to be a complex of FOD and SWD, with the swamp containing swamp maple and oak species. Canopy species in the forest consisted of sugar maple, shagbark hickory, swamp maple, and swamp oak. The understory was primarily made up of gray dogwood with lower abundances of choke cherry and nannyberry. Goldenrod, scarlet strawberry and garlic mustard were the most abundant species in the ground layer.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we51	2.21	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
we60	4.58	FOD6-5/SWD3 Fresh-Moist Sugar Maple Hardwood Deciduous Forest with a Maple Mineral Swamp complex	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. There is a Maple Mineral Swamp complex within the community
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we62	8.78	SWD1-1 Swamp White Oak Mineral Deciduous Swamp Type	This community was assessed from the edge of the agricultural field bordering this community, due to restricted property access. This community had abundant swamp white oak in the canopy cover, with Freeman's maple, red maple, red oak and green ash associates. Deep standing water within this community, with appearances of sensitive fern, blue-flag iris and sedge species within the ground cover.
		FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.
we68	0.97	SWT2-6 Meadowsweet Mineral Thicket Swamp	This community is dominated by understory vegetation of meadowsweet, with gray dogwood as an associate. Some canopy cover Is present and incuded ocasional green ash and bur oak. Ground cover includes Reed canary grass, jewelweed and sedge species.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we77	6.74	SWT2-6 Meadowsweet Mineral Thicket Swamp	This community is dominated by understory vegetation of meadowsweet, with gray dogwood as an associate. Some canopy cover Is present and incuded ocasional green ash and bur oak. Ground cover includes Reed canary grass, jewelweed and sedge species.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		FOD6-5/SWD3 Fresh-Moist Sugar Maple Hardwood Deciduous Forest with a Maple Mineral Swamp complex	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. There is a Maple Mineral Swamp complex within the community

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we84	57.84	FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we86	6.63	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we87	47.14	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.
we90	80.29	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we91	9.67	FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.
		FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
		SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.
		SWT2-9 Gray Dogwood Mineral Thicket Swamp	Gray dogwood dominates the understory in this community. Canopy species are rare to ocassional and include bur oak, white elm and shagbark hickory.
we94	1.00	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWT2-9 Gray Dogwood Mineral Thicket Swamp	Gray dogwood dominates the understory in this community. Canopy species are rare to ocassional and include bur oak, white elm and shagbark hickory.
we95	0.71	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we99	32.36	Not Determined	No Community Description Available. The majority of this community is beyond 120m of a Collector Line that runs along an exisitng roadway.
we100	31.76	SWT2-6 Meadowsweet Mineral Thicket Swamp Type	This shrub-thicket community was dominated by meadowsweet, with occasional dogwood shrub cover. Reed-canary cover was also found throughout this community.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp Type	Dominated by Freeman's maple (swamp maple), other canopy associates include ash species, white pine, willow species and black walnut. This community was assessed along the agricultural field due to deep water, restricting access into community. Dogwood and willow shrubs buffer this community with the agricultural field.
		FOD1 Dry-Fresh Oak Deciduous Forest Ecosite	Located along the north portion of the deciduous forest/swamp communities along the southern portion of this property. This community is fragmented due to two agricultural fields edged along the outside borders. Canopy cover is approximately 70 percent, with a variable mixture of species within the canopy cover. Trembling aspen, sugar maple, red, white and bur oak, American elm and Freeman's maple were found consistently throughout this community.
		SWD1-1 Swamp White Oak Mineral Deciduous Swamp Type	This community was assessed from the edge of the agricultural field bordering this community, due to restricted property access. This community had abundant swamp white oak in the canopy cover, with Freeman's maple, red maple, red oak and green ash associates. Deep standing water within this community, with appearances of sensitive fern, blue-flag iris and sedge species within the ground cover.
		MAM2-2 Reed-canary Grass Mineral Meadow Marsh Type	This community is located throughout this property. Reed-canary grass dominant, occasional appearances of milkweed, meadowsweet and dame's rocket are found primarily bordering these communities.
		FOD1-1 Dry-Fresh Red Oak Deciduous Forest Type	Upland community with predominantly red oak, white ash and American beech located within the canopy cover. Ground cover was dominated by large-leaved aster. One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		CUM1-1 Dry-Moist Old Field Meadow Type	Community dominated by grass species, primarily timothy. Areas of reed-canary meadow marsh pockets throughout this community.
we101	50.59	SWD2-2b Green Ash Mineral Deciduous Swamp Type	Small swamp pocket, located adjacent to the farm road along the hedgerow. Primarily green ash, with swamp oak and American elm associates.
		MAS2-9a Forb Mineral Shallow Marsh Type	A mixture of species throughout this community. Blue-flag iris, sedge and grass species as well as sensitive fern was observed from the outside edge of this community. Due to large areas of open and pooling water, this community was assessed along the deciduous swamp border, and was located in the center of deciduous swamp community at the south end of the property.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp Type	Dominated by Freeman's maple (swamp maple), other canopy associates include ash species, white pine, willow species and black walnut. This community was assessed along the agricultural field due to deep water, restricting access into community. Dogwood and willow shrubs buffer this community with the agricultural field.
		SWT2-6 Meadowsweet Mineral Thicket Swamp Type	This shrub-thicket community was dominated by meadowsweet, with occasional dogwood shrub cover. Reed-canary cover was also found throughout this community.
we106	21.60	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.
		MAM2-6 Broad-leaved sedge Mineral Meadow-Marsh	This community is dominated by Lakebank sedge in the ground layer, with associates of cattail and Reed canary grass. Understory species were ocassional and included gray dogwood and narrow-leaved meadowsweet.
		MAS Mineral Shallow marsh	This community is dominated by various grass species with cattail and wild teasel also present.
		MAS2-10 - Phragmities Shallow Marsh	This shallow marsh community is dominated by phragmities, with areas of standing and pooling water. This community is located in areas of disturbance.
		SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.
		SWT2-6 Meadowsweet Mineral Thicket Swamp	This community is dominated by understory vegetation of meadowsweet, with gray dogwood as an associate. Some canopy cover Is present and incuded ocasional green ash and bur oak. Ground cover includes Reed canary grass, jewelweed and sedge species.
		SWT2-9 Gray Dogwood Mineral Thicket Swamp	Gray dogwood dominates the understory in this community. Canopy species are rare to ocassional and include bur oak, white elm and shagbark hickory.
we118	0.78	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we124	235.34	FOD5-2/SWD2-2 Dry-Fresh Sugar Maple-Beech Deciduous forest with a Green Ash Mineral Deciduous Swamp complex	The canopy of this community is comprised predominately of Sugar maple, American Beech, with lesser components of Red oak and American basswood, while both the sub-canopy and understory primarily consisted of American beech, Sugar maple and Hop hornbeam. The ground cover consisted of Sedge species, Avens species and Christmas fern. A complex of Green Ash Mineral Deciduous Swamp is associated with the above community due to the presence of low-lying areas containing hydrophilic species and some pools of water.
		FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.
		FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	This community occupies approximately the southwestern third of the property. The most abundant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The moderately thick understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. Soils were variable through the community, with a clay dominated soil in some areas and a sandier, siltier component in others. Mottles were present within 17cm and 25 cm of the surface respectively for each type. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools (5 -10cm) with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.
		FOD9-1/SWD - Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Deciduous Swamp complex	This community had a canopy comprised predominately of Sugar maple, Red oak and White oak. The sub-canopy consisted of mainly Sugar maple with some White ash, Hop hornbeam, Red oak and American beech. The understory contained mostly Sugar maple and American beech, while the ground cover consisted of Large-leaved aster, Sedge species and Goldenrod species. A deciduous swamp is Complexed throughout this community.
		FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		MAM2-2 Reed-Canary Grass Mineral Meadow Marsh	This community was a small strip consisting predominantly of reed canary grass meadow marsh, with a few mixed tree and shrub species at either end. The dominant species were reed-canary grass with broad-leaved cattail, and the occasional goldenrod, teasel, and wild carrot confined mainly to the border. A few oaks and elms made up a hedgerow habitat on either end of the community.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
		SWD3-2/FOD9 Silver Maple Mineral Deciduous Swamp with a Fresh-Moist Oak-Maple-Hickory Deciduous Forest inclusion	This community is dominated by silver maple in the canopy with green ash and oak associates. Understory species were restricted to inclusion sites and otherwise sparse, species included buttonbush,high-bush blueberry and high-bush cranberry. A Fresh-Moist Oak Maple Hickory deciduous forest is also present.
we131	1.51	MAS2-1/MAM2-2 Cattail Mineral Shallow Marsh with a Reed Canary Grass Mineral Meadow Marsh inclusion	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we147	0.62	MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we150	1.85	SWD/CUW Deciduous Swamp with Cultural Woodland Inclusion	This community is predominantly a deciduous swamp, with a small portion (less than 0.5ha) of a cultural woodland, dominated by deciduous tree cover.
we152	2.51	SWT2-4 Buttonbush Mineral Thicket Swamp	This was a larger community located near the southeastern corner of the property within the large FOD6-5. A sparse canopy made up of Freeman's maple, hop hornbeam, red oak and eastern buttonbush overtopped a dense sub-canopy dominated by eastern buttonbush. Smaller components of winterberry and highbush blueberry were also observed in the sub-canopy. The ground layer consisted primarily of ferns and sedges. Surface water covered approximately 95% of the area and was at least 60cm deep.
		FOD6-5/SWD2-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp	Dominant species were red and white oak with sugar maple. The sub-canopy consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. Complexed within this community was a wetland community – green ash mineral deciduous swamp.
		SWM2-2 Swamp Maple – Conifer Mixed Swamp	The canopy was dominated by eastern hemlock and Freeman's maple, with a smaller component of white pine. The sub-canopy consisted of hop hornbeam, witch-hazel, and yellow birch. Winterberry and eastern buttonbush were the most abundant understory species, while the ground layer consisted of royal fern, cinnamon fern, and bitter nightshade.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we156	0.99	SWT2-2 Willow Mineral Thicket Swamp	This community was located at the southwest corner of the property. The dominant canopy species was willow, followed by a moderately thick understory of eastern buttonbush and red-panicled dogwood. Ground vegetation consisted of reed-canary grass, sedges and various hydrophitic forbs. The community contained a pool of standing water of at least 1 to 2ft in depth over 30% of its area. There was an inclusion of cattail shallow marsh.
we160	0.74	MAS2-2 Bulrush mineral swamp	Assessed from the roadside, this community was dominated by bulrush species,with standing and pooling water along drainage features.
we164	1.93	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we166	2.40	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we167	20.96	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.
		SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.
we170	32.06	MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
		SWT2-9 Gray Dogwood Mineral Thicket Swamp	Gray dogwood dominates the understory in this community. Canopy species are rare to ocassional and include bur oak, white elm and shagbark hickory.
we171	48.88	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.
we174	1.07	Not Determined	No Community Description Available. The majority of this community is beyond 120m of a Collector Line that runs along an exisitng roadway. This community is surrounded by agricultural lands.
		FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we176	5.49	FOD/SWD2-2 Deciduous Forest with a Green Ash Mineral Deciduous Swamp	A variety of tree species are present in the canopy and sub-canopy. No species are dominant.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.
we181	9.52	MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we182	19.27	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	This swamp community consisted of a canopy layer dominated by Freeman's maple with white elm as an occasional associate. Southern arrow-wood, common elderberry, marsh rose, and Alleghany blackberry, among others, made up the shrub layer, while the ground layer consisted of species such as spotted touch-me-not, soft rush, devil's beggar-ticks, and marsh bedstraw.
		SWT3-4 Buttonbush Organic Thicket Swamp	This community had a canopy composed mainly of eastern buttonbush and winterberry. The sub-canopy was composed of narrow-leaved meadowsweet, while sensitive fern was the sole species found in the understory.
we183	2.28	FOD5-2b Dry-Fresh Sugar Maple – American Beech Deciduous Forest Type	This community was upland, with dry soils and no areas of standing or pooling water. Dominated by sugar maple and American beech, with little to no associates occurring within the canopy. True Solomon's seal, blue cohosh, poison ivy and garlic mustard occurred throughout the ground layer.
		SWT2-6 Meadowsweet Mineral Thicket Swamp Type	Separated a sugar maple-beech deciduous forest, this swamp thicket community was dominated by meadowsweet. Very difficult to walk through due to high density vegetation.
we184	45.25	FOD5-4 Dry-Fresh Sugar Maple-Ironwood Deciduous Forest Type	This community was dominated by sugar maple and ironwood within the canopy layer.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we186	0.59	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we202	0.93	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we210	1.24	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we216	0.87	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we218	0.92	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we220	47.07	FOD9-2/SWD1-2 Fresh – Moist Oak – Maple Deciduous Forest with a complex of Bur Oak Mineral Deciduous Swamp	This community occupied approximately the eastern third of the property. The canopy was dense, with red oak, white oak, sugar maple and red maple as dominants. Red oak, sugar maple, American beech, and white oak made up the sub-canopy. The thick understory consisted of blue beech, American beech, sugar maple and hop hornbeam, while sedges, goldenrod, large-leaved aster and avens made up the ground layer. The moisture regime was variable throughout the community but fell between 4 and 6 due to the location of the mottles in the soil profile. In some areas the soils were clay dominated and had a moisture regime of 6, in others there was a higher sand content and mottles at 40cm. Complexed within this forest was a bur oak mineral deciduous swamp. Some portions of the swamp complex were more dominated by red maple or green ash with some younger oaks in lower proportions. There was evidence of logging and recreational activities taking place within the community and its complex.
		MAM2-2 Reed-canary Grass Mineral Meadow Marsh	As is typical of these communities, reed canary grass dominated the herbaceous layer, with rare occurrences of broad-leaved cattail. Very rare shrub occurrences included narrow-leaved meadowsweet, buttonbush, and common elderberry. No surface water was observed.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we222	0.50	MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we226	7.40	FOD6-5 Fresh-Moist Sugar Maple Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we227	20.04	SWD3-3 Swamp Maple Mineral Deciduous Swamp	This community occupies a network of lowland among the deciduous forest community described above. The dominant canopy species are Freeman's maple, green ash, American elm, and a small component of swamp white oak. Freeman's maple, American elm, and green ash make up the sub-canopy. The understory is composed of winterberry, highbush blueberry, narrow-leaved meadowsweet, and smaller components of eastern buttonbush and a rose species. Sedges dominated the ground layer along with grasses and ferns. At the time of the survey there were pools of surface water of up to about 2ft deep covering approximately 70% of the land area.
we229	9.35	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	This community was located in the northeastern corner of the property. The canopy consisted of a thick layer of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the moderately thick sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated a sparse ground layer. There was a swamp maple swamp complex within the community.
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community was located within the FOD6-5 in the northeastern corner of the property. The community was dominated by a thick shrub layer of eastern buttonbush followed by lesser amounts of winterberry and highbush blueberry. The ground vegetation was thin and consisted primarily of ferns, sedges, and beggar ticks.
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community was located just inside the property near the center of the northern boundary. There were a few scattered ash trees overtopping the much thicker and dominant sub-canopy of buttonbush. Smaller amounts of raspberry and narrow-leaved meadowsweet were scattered throughout. The ground vegetation was sparse and consisted of bitter nightshade and goldenrod. There was approximately 25 to 50cm of standing water in the center of the community. Within this community, a dry-fresh sugar maple-oak deciduous forest (FOD5-3) was present.
we230	2.43	SWT2-4 Buttonbush Mineral Thicket Swamp	The community was dominated by a thick shrub layer of eastern buttonbush followed by lesser amounts of winterberry and highbush blueberry. The ground vegetation was thin and consisted primarily of ferns, sedges, and beggar ticks.
we231	2.98	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we232	29.20	SWD	This swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access
we233	5.05	Not Determined	No Community Description Available. This wetland community makes up the Provincially Significant Beaver Creek Wetland Complex which is comprised of 46 wetland units, consisting of 78% swamp and 22% marsh.
we234	6.67	FOD9-1 Fresh – Moist Oak-Sugar Maple Hardwood Deciduous Forest	This small community is found adjacent to a shallow marsh and abutted by hay fields. The canopy is dominated by red oak, sugar maple and white ash, with ocassional red maple. The understory and ground layer were sparse, consisting of hawthorne species and goldenrod species respectively.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
		MAS2-4 Broad-leaved sedge mineral shallow marsh	This community had an understory consisting of narrow-leaved meadowsweet and red-berried elderberry at less than 60% canopy cover. The Understory was the dominant vegetation and included lakebank sedge as the predominant vegetation, with reed canary grass and cattail occuring throughout.
we235	9.86	FOD6-5/SWD1-2 Fresh-Moist Sugar Maple-hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	In this community the most prevalent canopy species were Red oak, Sugar maple, American beech and White oak. The sub-canopy was comprised of Sugar maple, with American beech and Red oak in equal proportions and some Hop hornbeam. The understory consisted of American beech, Sugar maple and Red oak, while the ground layer included various Raspberry species, Large-leaved aster, with Goldenrod species and Sedge species occurring in equal proportions. Evidence of hunting and logging was observed. The soil in the deciduous forest community was a fine to very fine sandy clay with mottles and gley observed at 20cm. Approximately 60cm of surface water was present in the swamp complex.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we237	1.38	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we240	0.91	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The understory consisted of Reed canary grass and Canada goldenrod. The ground layer dominated by common water plantain with occasional occurrences of Canada goldenrod and Reed canary grass. The community was associated with a hedge row and drainage ditch feature.
we242	3.67	AG-Hay	This agricultural crop was hay (uncut) during the time of survey.
we244	58.77	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.
		FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we253	4.65	FOD6-5/SWT2-4 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest with a Buttonbush Mineral Thicket Swamp inclusion.	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. This community also contained a Buttonbush Mineral Thicket Swamp inclusion.
we260	9.90	FOD6-5/SWD2-2/MAS2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp and Broad-leaved Sedge Shallow Marsh	This community occupies the southwestern corner of the property, and had a high proportion of young regenerating trees and saplings. The tallest canopy layer was fairly open at just under 60% cover. Dominant species were red and white oak with sugar maple. The sub-canopy was much denser and consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the thick understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. There were cut stumps throughout the community indicating it had undergone logging in the past. Complexed within this community were two wetland communities – green ash mineral deciduous swamp and broad-leaved sedge shallow marsh. Most of the swamp pockets had pools of water at least 20cm deep and abundant emergent vegetation.
we263	6.56	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we268	18.27	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Mineral Deciduous Swamp	The primary canopy species were red oak, sugar maple, and American beech with a sub-canopy of American beech, hop hornbeam, and sugar maple. The understory was moderately dense and consisted of American beech, hop hornbeam, and sugar maple. A moderately thick coverage of large-leaved aster, thimble-berry, and rough goldenrod dominated the ground layer. The soils were clay dominated and the moisture regime was 5/6. Complexed within this FOD was a swamp maple mineral swamp community, dominated by Freeman's maple, green ash, and ferns and sedges. Some evidence of disturbance could be seen throughout the site in the form of light logging activities and installation of drainage pipes within areas of the swamp complex.
we269	0.51	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we275	4.95	FOD9-1/SWD2-2/MAS2-4 Fresh – Moist Oak – Sugar Maple Deciduous Forest with a Green Ash Swamp complex and inclusion of Broad-leaved Sedge Mineral Shallow Marsh	This community occupies the southeastern corner of the property and contains a green ash mineral deciduous swamp complex. Dominant canopy species were red and white oak with sugar maple and ash species. Smaller components of red maple and swamp white oak were also present and primarily occupied a transition zone between the forest and swamp communities. The sub-canopy was denser than the canopy and consisted of sugar maple with a much smaller proportion of hop hornbeam and American beech. The understory appeared to consist exclusively of sugar maple, and the dominant ground layer species were wild red raspberry and avens. There was evidence of recent and past logging activity. A green ash swamp was complexed within the community and there was a small broad-leaved sedge shallow marsh located along the western edge.
we276	1.29	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash.
we279	3.30	FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we281	2.21	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we282	6.25	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWT2-6 Meadowsweet Mineral Thicket Swamp	This community is dominated by understory vegetation of meadowsweet, with gray dogwood as an associate. Some canopy cover Is present and incuded ocasional green ash and bur oak. Ground cover includes Reed canary grass, jewelweed and sedge species.
we284	3.33	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.
		MAM2-2 Reed-Canary Grass Mineral Meadow Marsh	This community was a small pocket of meadow marsh adjacent to the FOD9-1 and surrounded by agricultural fields. A few scattered willow trees grew among a ground layer made up of reed-canary grass, narrow-leaved cattail, and common burdock. There was some surface water over approximately one-quarter of the interior of the community.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we286	10.04	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we288	22.59	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we292	0.64	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we294	2.10	FOD9-1/SWT2-4/SWD1-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Buttonbush Mineral Thicket Swamp inclusion and a Bur Oak Mineral Deciduous Swamp complex	This community had a canopy consisting of White oak, Red oak, Sugar maple and White pine. The sub-canopy contained Hop hornbeam, Blue beech and White pine, while the understory consisted largely of Black cherry, Blue beech, Hop hornbeam and White pine. The ground layer included Sedge species, Large-leaved aster and Millspaugh's blackberry. Evidence of logging was observed in this community. A Buttonbush Mineral Thicket Swamp occurred within this community and was added as an inclusion. The primary species here included Eastern buttonbush, Winterberry, Red-osier dogwood and Narrow-leaved meadow sweet. Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well, with pools of surface water up to 60cm in depth. The soils in this Oak-Sugar maple deciduous forest community had a moisture regime of 5-6.
		MAM 2-2 Reed Canary Mineral Meadow Marsh	This community was dominated by Reed canary grass in the ground layer along with Avens and Jewelweed. NO Canopy or understory vegetation was present.
		MAS2-4 Broad-leaved sedge mineral shallow marsh	This community occurred in two locations in the southwestern part of the property and consisted of an understory of Dogwood species and Narrow-leaved meadow sweet. The ground layer was comprised of Sedge species, Reed-canary grass, Broad-leaved cattail and Wool-grass. Water depth was approximately 20-30cm.
we295	30.34	MAM2-2/CUM1-1 Reed Canary Mineral Meadow Marsh with a Dry-Moist Old Field Cultural Meadow complex	This community was not subject to a complete inventory and was delineated based on a preliminary assessment and air photo interpretation. The most prevalent species in this community included Reed canary grass, with Blue vervain and Beggar-ticks species in similar proportions. Rushes and grasses were also present. This community appeared to have been tilled in the past; surface water was observed. The Cultural Meadow complex included Goldenrod species, Wild teasel, Aster species, Tufted vetch and Common milkweed.
we299	1.03	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we303	0.53	MAM2-2/CUT1 Reed Canary Grass Mineral Meadow Marsh with a Mineral Cultural Thicket inclusion.	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood. A Mineral Cultural Thicket is also present in this community.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we304	0.53	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we308	0.68	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we309	7.48	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAM2-2/MAS2-1 Reed Canary Grass Mineral Meadow Marsh Complex with Cattail Mineral Shallow Marsh	This community is dominated by the ground layer, and includes a variable mix of Reed Canary grass, cattails and Bur-reed species. Willow shrubs are rarely present in the understory.
we310	3.36	FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This community is dominated by Green ash and American elm in the canopy. Understory vegation includes Gray dogwood and hawthorn species. The ground layer is dominated by common milkweed and goldenrod species.
we311	0.94	FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.
we312	2.78	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we314	1.84	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we315	11.57	SWD3-3/FOD6-5 Swamp Maple Mineral Deciduous Swamp with a Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.
we317	1.25	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we320	1.34	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we322	3.01	FOD9-2/SWD - Fresh – Moist Oak – Maple Deciduous Forest with a complex of Deciduous Swamp	The canopy contained red oak, white oak, sugar maple and red maple as dominants. Red oak, sugar maple, American beech, and white oak made up the sub-canopy. The understory consisted of blue beech, American beech, sugar maple and hop hornbeam, while sedges, goldenrod, large-leaved aster and avens made up the ground layer. Complexed within this forest was a deciduous swamp.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we324	14.42	FOD7-2/MAM2-2 Fresh – Moist Ash Lowland Deciduous Forest with a Broad – Leaved Sedge Meadow Marsh inclusion and a Dry – Moist Old Field Meadow Complex with a Reed Canary Grass Mineral Meadow Marsh inclusion	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover. A Reed Canary Grass Mineral Meadow Marsh inclusion was identified within the above community.
we326	10.63	FOD9-2/MAM2-2 Fresh-Moist Oak-Maple Deciduous Forest with a Reed-canary Grass Mineral Marsh inclusion	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species. A Reed Canary Grass Mineral Meadow Marsh inclusion was identified within the above community.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we329	49.17	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
		MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This community ran from the northern end of the wooded riparian valley northwards to the northern tip of the property. It consisted of an open community of reed-canary grass with much smaller amounts of European stinging nettle and teasel. It was associated with a creek or drainage feature that connected the northern edge of the property to the riparian valley. It contained an open aquatic community at its northern tip.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we331	15.19	FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite	This community occupied a steep slope along the central eastern edge of the riparian valley. It was fairly mixed in terms of composition, with sugar maple, red oak, large-tooth aspen and hemlock dominating the canopy. The sparse sub-canopy contained primarily sugar maple, hop hornbeam and American beech. The understory consisted exclusively of scattered sugar maple saplings, while the ground vegetation was dominated by sugar maple, panicled aster, avens, and thimble berry.
		FOD6-5/SWD3-1 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Red Maple Mineral Swamp	This community occupied the northeastern tip of the riparian valley and was situated primarily on table land. The dominant canopy species were sugar maple, red oak, and American beech, and there was a thick sub-canopy of sugar maple, hop hornbeam and American beech. The understory consisted mostly of saplings of sugar maple and hop hornbeam. Panicled aster, avens, and raspberry species made up the fairly sparse ground layer. Complexed within this were a few small pockets of red maple mineral swamp, containing shallow pools of water of about 30cm in depth.
		FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community was located in the south-central portion of the riparian valley and occupied the bottomland therein. It had a fairly open canopy (approximately ≤60%) consisting of green ash and a smaller component of shagbark hickory. The sub-canopy was made up of green ash, sugar maple, and white elm. The understory consisted of hop hornbeam, sugar maple, green ash and blue beech. Raspberries, panicled aster and moneywort dominated the patchy ground cover. The soils were loam and clay dominated and the moisture regime was 5. A small creek flowed through the community and there was evidence of seasonal flooding.
we332	4.40	SWD3-3 Swamp Maple Mineral Deciduous Swamp	This community was a large swamp located within the FOD6-5. The canopy was dominated by Freeman's maple, green ash, red maple, and white elm; while the thinner sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory was very sparse and consisted mainly of dogwood species and narrow-leaved meadowsweet with a smaller component of winterberry. Sedges, ferns, and beggar-ticks predominated in the ground layer. There were several shallow pools (<60cm deep) throughout and many contained emergent vegetation.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	This community is found northeast of the proposed location of turbine R11TO36 within the Beaver Creek PSW Complex. Trees and shrubs are absent from this community. The dominant species within this community are reed canary grass followed by grass-leaved goldenrod, swamp milkweed and Kentucky blue grass.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we336	61.22	SWD2-2 Green Ash Mineral Deciduous Swamp	This community was a small green ash swamp at the northwest edge of the property. It was associated with a small creek running from west to east across the property as well as the adjacent reed-canary grass mineral meadow marsh. The canopy consisted of green ash, white elm, oak species, and shagbark hickory. White elm and green ash made up the thin sub-canopy. The shrub layer consisted mainly of Freeman's maple and green ash saplings, while reed-canary grass and panicled-aster made up the ground layer. Pooled surface water covered about 70% of the area at depths of up to 60cm.
we340	85.39	FOD9-1 Fresh-Moist oak – sugar maple deciduous forest	The most abundant canopy species in this community were sugar maple, white oak and red oak. The understory consisted primarily of raspberry species., mapleleaf viburnum and witch hazel. Ground vegetation was dominated by aster species rough goldenrod, spotted crane's bill, and white avens.
		FOD9-1/SWD3-1/MAS2-4 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Red Maple Mineral Deciduous Swamp and Broad-leaved Sedge Mineral Shallow Marsh complex	This community, located in the southern portion of the property, had a canopy of Sugar maple, Red oak, White pine and Ash species. The sub-canopy contained Sugar maple, Hop hornbeam, Red oak and White oak. The understory consisted of Sugar maple, American Beech, Hop hornbeam and Blue beech, while the ground layer included Millspaugh's blackberry, Pennsylvania sedge, Maple-leaved viburnum and Wild red raspberry. Evidence of disturbance was present as garbage (old cars/sheds), old roads and some logging. Areas of Red Maple Deciduous Swamp and Broad-leaved sedge Shallow Marsh were found throughout the forest community and included as a complex. Water of 15cm in depth was observed at a potential seep where Water-cress was present. The soil in the Oak-Sugar maple deciduous forest were a sandy clay with a moisture regime of 6 and mottles at 25cm.
		SWD3-3 Swamp maple mineral deciduous swamp	The most abundant canopy species in this swamp were freeman's maple and green ash. The understory was made up of button bush, and the ground vegetation consisted mostly of sensitive fern and eastern marsh fern with false nettle and fowl mannagrass.
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community contained sparse Red maple in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Fern species, Sedge species, Grass species and Duckweed. Water was present throughout this community at a depth from 5-40cm.
we342	18.21	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we344	0.85	SWT2-9 Grey Dogwood Mineral Thicket Swamp	The canopy of this community included occasional willow trees, bur oak, shagbark hickory, white elm, green ash and cottonwood. The understorey of this community was dominated by grey dogwood, with lesser components of American elm and narrow leaved meadowsweet. The ground cover included species such as reed canary grass, bedstraw species, sedge species, rough goldnerod, avens species, riverbank grape and a horsetail species.
we349	3.91	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we351	56.86	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we353	22.91	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.
		MAS Shallow Marsh	This community has less than 25% tree and shrub cover, predominantly grass and sedge species. Areas of standing and pooling water occur frequently
we356	0.81	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we357	197.88	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.
		SWD3-1 Red maple Mineral Deciduous Swamp	Red maple is the dominant canopy species in this community, green ash, American elm and trembling aspen are common associates. The sub-canopy composition is the same. Understory vegetation included American elm, common buckthorn and riverbank grape. The ground layer is dominated by golden rod species and sensitive fern.
we358	1.32	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we360	27.78	FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		SWD3-2 Silver Maple Mineral Deciduous Swamp	The canopy in this community primarily consisted of Silver maple, Green ash, Red oak and Red maple. The sub-canopy also contained Silver maple, Green ash and Red maple. The understory was predominately Spicebush, with lesser components of Silver maple and Green ash, while the ground layer was largely sensitive fern with Tall white aster and Spicebush also present.
we361	32.58	MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
		SWD3-1/MAS2-9/SAF1-3 Red Maple Mineral Deciduous Swamp with a Forb Mineral Shallow Marsh and Duckweed Floating-leaved Shallow	The most abundant species in the canopy were Red and Silver maple, with Red oak and American Beech. The sub-canopy was predominately comprised of Red oak, American Beech and Blue Beech and the understory contained some Black ash with Red Osier dogwood in low abundance. The ground layer consisted of Sensitive fern, Swamp beggar-ticks, Royal fern and Spinulose wood fern. The above swamp community is complexed with small ponds associated with small shallow marshes which are found throughout. The soil in the deciduous swamp was found to be a silty very fine sandy clay loam with a moisture regime of 6 and both mottles and gley at 20cm. The depth to bedrock was >120cm.
we364	0.69	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we365	0.60	SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.
		CUT1/MAM2-2 Sumac Cultural Thicket with a Reed Canary Grass Mineral Meadow Marsh inclusion	Staghorn sumac is the dominant canopy cover in this community. Occasionally, poplar species and black walnut was present in the canopy and ground cover is dominated by reed canary grass.
we373	18.60	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we376	1.72	MAS2-10 - Phragmities Shallow Marsh	This shallow marsh community is dominated by phragmities, with areas of standing and pooling water. This community is located in areas of disturbance.
we377	1.90	SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.
we380	0.61	SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.
we381	3.50	FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.
		FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.
we382	8.54	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.
		FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.
		SWD Deciduous Swamp	Assessed from the roadside, this swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access
we383	0.93	MAS2-1/FOD8-1 Cattail Mineral Shallow Marsh with a Fresh-moist Poplar Deciduous Forest inclusion	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash. Occuring within the community was a fresh-moist poplar deciduous forest was .
we384	0.94	FOD3-1/MAM2-11* Dry to Fresh Poplar Deciduous Forest with a Foxtail Mineral Meadow Marsh inclusion	Tembling aspen is the dominant vegation in the canopy, sub-canopy and understory in this community. Ground cover included goldenrod species and phragmites along with a Foxtail Mineral Meadow Marsh inclusion.
we385	0.89	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we387	0.65	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we389	1.44	FOD5-2/SWD3-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest Type	The most abundant canopy species in this community were American Beech and Sugar Maple with some black cherry and yellow birch. The understory consisted primarily of young sugar Maple and American beech with ironwood and black cherry also present. Jack in the pulpit and riverbank grape was the dominant ground vegetation, followed by Canada mayflower and trillium.
we391	1.26	CUM1-1/MAS2-1 Dry-Moist Old field cultural meadow with a Cattail Mineral Shallow Marsh inclusion.	This community consisted of several forbs and grasses in varying composition and dominance including Goldenrod species, ox-ey daisy, wild teasel, wild carrot, tufted vetch, reed canary grass, Awnless brome, Scarlet strawberry, Knapweed, Kentucky bluegrass. Also included was a community dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash.
we392	1.98	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.
we393	0.68	SWT2-2 Willow Mineral Thicket Swamp	This community is dominated by understory vegetation layer of willow shrub species. Ground cover is dominated by Reed canary grass.
we395	0.81	SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.
we396	57.32	SWD 2-2 Green Ash Mineral Deciduous Swamp	Surveyed from the edge of the property, this community was dominated by green ash in the canopy, with silver maple and trembling aspen. The understory vegetation was dominated by poison ivy, with spicebush and speckled alder also present. Ground vegetation included Sensitive fern, sedges and jewelweed as the dominant species.
		SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.
we397	27.46	SWD 2-3* Ash-Poplar Deciduous Mineral Swamp	This community was dominated by green ash in the canopy with eastern cottonwood and trembling aspen also present. The understory consisted of young green ash, wild red raspberry, narrow-leaved meadowsweet and gray dogwood. Virginia creeper was the dominant ground cover within the community with sumac and jewelweed also present.
we398	1.90	FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we399	21.95	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we402	1.97	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we403	12.39	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.
we404	21.47	SWD2-2 Green Ash Mineral Deciduous Swamp	This swamp community had a canopy consisting of Green ash, Red maple and Silver Maple. The understory contained mainly spicebush, Virginia creeper and Maple-leaved viburnum, while the ground layer included Jewelweed, Sensitive fern and Bladder sedge species. Vernal pooling occurred throughout the community.
we405	0.98	CUW1-3*/MAM2-6 Freeman Maple Cultural Woodland with a Broad-leaved Sedge Mineral Meadow Marsh inclusion	The canopy of this community consisted of Cottonwood species, with the sub-canopy containing both Cottonwood and Freeman's maple. The understory included Freeman's maple as well as Canada goldenrod, Tall white aster, Common boneset. Evidence of past clearing was observed and this community appears to be the result of regeneration. A broad-leaved sedge meadow marsh occurred as an inclusion within the woodland community. The cultural woodland contained a clay-loam soil with an organics layer of 22.8cm in depth and a moisture regime of 4-5. Depth to bedrock was >120cm.
we407	21.01	SAF1-1/SAF1-3 Waterliliy-bullhead lily Floating leaved shallow aquatic	This community is dominated by Bullhead lily and unidentified submergents and includes a community that was dominated by duckweed. Infrequent occurrences of bur oak, narrow-leaved meadowsweet and winterberry were present around the border of the community.
		FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	The canopy in this community was dominated by Green ash, with Red maple and sparse White elm and Trembling aspen. Green ash and White elm were the most abundant species in the sub-canopy, with infrequent occurrences of Red maple and Trembling aspen. The understory included Green ash, White elm, Staghorn sumac and Nannyberry, while the ground layer was largely Sensitive fern with Canada and Tall goldenrods and Raspberry species. The soil was a sandy –clay with a moisture regime of 6 and mottles observed at 45cm. Depth to bedrock was >120cm. A wet area in the center of the community containing surface water and consisting of Cattails and Bullrush was identified as an inclusion. A pathway was ploughed from this community to a nearby drainage ditch.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we408	129.89	FOD9-2/MAM2-11* Fresh-Moist Oak-Maple Deciduous Forest with a Common Reed Mineral Meadow Marsh inclusion	This community had a canopy consisting of Red oak, Red maple and Green ash, with few Black cherry and Willow species. The sub-canopy also contained Red oak and Red maple with sparse occurrence of Black cherry and Green ash. The understory included mainly spicebush, with American beech and Currant species, while the ground layer was comprised of Calico aster, Canada goldenrod, Reed-canary grass and Riverbank grape. The community is fairly disturbed as roads and trails exist throughout. The soil was a clay-loam with a moisture regime of 5-6. Mottles and gley were observed at >80cm and the depth to bedrock was >120cm. An inclusion of a Common reed meadow marsh was present at the southern edge of the community.
		MAS2-1/SAF1-3 Cattail Mineral Shallow Marsh with a Duckweed Floating-leaved Shallow Aquatic inclusion	This marsh community consisted largely of Broad-leaved cattail and Reed-canary grass, with components of Canada and Tall goldenrods. Sparse Calico aster were also present. A Duckweed Floating-leaved Shallow Aquatic community occurred as an inclusion within the shallow marsh community.
		SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
		SWD3-2 Silver Maple Mineral Deciduous Swamp	The canopy in this community primarily consisted of Silver maple, with Green ash, Red oak and Red maple. The sub-canopy also contained Silver maple, with Green ash and Red maple, Bur Oak and Blue Beech. The understory included Buttonbush, Spicebush, winterberry, Highbush Blueberry with components of Silver maple and Green ash, while the ground layer contained sensitive fern, with Tall white aster, reed canry grass, sedges.
		SWD4-5*/SWD2-1 Yellow Birch-Red Maple Mineral Deciduous Swamp with a Black Ash Mineral Deciduous Swamp complex	This community consisted of Red maple, Yellow birch and Black ash in the canopy, with infrequent Shagbark hickory and White elm. The ground layer was comprised of Sensitive fern, Moss species, Spinulose wood fern and Ostrich fern. Occurring throughout the community was a complex of Black ash mineral deciduous swamp.
		SWD5-1 Black Ash Organic Deciduous Swamp	The canopy in this community consisted of Black ash, Red maple and Yellow birch, with infrequent Freeman's maple and White elm. The understory contained occasional Spicebush and the ground layer included Sensitive fern, Moss species, and Spinulose wood fern. Small pools of surface water were observed throughout the community. The soil was organic (Om) with a moisture regime of 7. Depth to bedrock was >120cm.
we409	9.94	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we414	0.58	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we418	0.88	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we420	0.79	SWD Deciduous Swamp	Assessed from the roadside, this swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access
we423	14.32	MAM2-1 Bluejoint mineral meadow marsh	Assessed from the roadside, this community is dominated by bluejoint grass along a drainage area.
we425	1.54	SWD3 Maple Mineral Swamp	This community is dominated by a variable mix of red oak, bur oak and silver maple. Sugar maple is also present as an associate. Understory vegetation includes gray dogwood and virginia creeper.
we426	1.71	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we427	9.76	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community occasionally contained sparse Red maple and ash species in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Highbush Blueberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Beggar-ticks, Fern species, Sedge species, Grass species and Duckweed.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we433	3.30	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.
we434	0.85	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
we436	22.83	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.

Table 4.6 Site Investigation Results - Wetlands

Feature No.	Total Feature Size (ha)	ELC Community	Description
we440	15.33	MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.
we441	2.74	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo1	0.13	FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	This community is dominated by willow trees in the canopy and is associated with riparian zones and creeks throughout the study area.	Feature 1 is a small woodland dominated by willow trees, and located adjacent to a farm-residential property approximately 110 m west of Mountain View Rd. A creek transverses through woodland.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland
wo2	0.66	FOD7-6* Fresh-Moist Manitoba Maple – Ash Lowland Deciduous Forest	The canopy was made up of young to mid-age Manitoba maple and ash, with an understory consisting of Manitoba maple, ash and grape vine. The ground layer was dominated by grape vine and panicled aster.	This community was confined to the banks of a stream running between residential and agricultural land uses, and some evidence of past logging was apparent.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland
wo3	1.52	FOD6-5 Fresh-Moist Sugar Maple Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 3 is located directly adjacent to Mountain view Road and surrounded by agricultural land uses. This deciduous forest community was transvered by a creek.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo4	0.45	FOD6-5 Fresh-Moist Sugar Maple Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 4 is located directly adjacent to Mountain view Road and surrounded by agricultural land uses. This community surrounds a residential property.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland
		FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo5	119.96	FOD6-1 Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest Type	The canopy species found in this community included sugar maple, white ash, red oak and Scots pine. Sub-canopy species present included Sugar maple, American beech, American basswood and hop hornbeam. The understory consisted of poison ivy, wild red raspberry, Virginia creeper and a currant/gooseberry species. The ground layer contained species such as Garlic mustard, wood nettle, aster species, goldenrod species, red raspberry, sedge species and spotted touch-me-not.	Feature 5 is a large woodland extending along Mountain view Road and is transversed by several streams and creeks. This feature is surrounded by agricultural and residential land uses. A carbonate open cliff ecosite community was identified on the west side of Mountain view Road within the woodland. The height of the cliff varied from 3m to 10m across its length and was primarily covered with moss and herbaceous species. Some smaller areas where the cliff face has undergone more fracturing had a higher predominance of shrubs and younger trees. A portion of the Bruce Trail crosses this community.	Supports woodland breeding amphibian habitat Supports a deer congregation area Cliff and Talus Communities are present	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located within the Mountainview Conservation Area.
		FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest	The community occupies a tableland near the roadside and a downward slope to the east. Sugar maple was the dominant canopy species, followed by basswood, and a smaller component of white ash. The sparse sub-canopy appeared to consist exclusively of sugar maple. The understory was also thin and contained young sugar maple and black cherry. Common ground layer species were zig-zag goldenrod, aster species and grasses.			
		FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This community is dominated by Green ash and American elm in the canopy. Understory vegation includes Gray dogwood and hawthorn species. The ground layer is dominated by common milkweed and goldenrod species.			
		MAS2-1 Cattail Mineral Shallow Marsh	These communities are dominated by variable amounts of common and narrow-leaved cattail. Reed Canary grass is also present in these communities.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		CLO1 Carbonate Open Cliff Ecosite	This community generally runs in a north-south direction between the TAT1-7* and the FOD5-8 in the Mountainvew Conservation Area. The dominant species were grasses, celandine, garlic mustard and herb-robert. The most commonly observed woody species were red raspberry, grape vine, and young American basswood.			
wo7	0.67	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	This community is confined by Walker Road and Kemp Road East. The feature is surrounded by active agriculture and residential land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland
wo8	0.73	FOD6-1 Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest Type	The canopy species found in this community included sugar maple, white ash, red oak and Scots pine. Sub-canopy species present included Sugar maple, American beech, American basswood and hop hornbeam. The understory consisted of poison ivy, wild red raspberry, Virginia creeper and a currant/gooseberry species. The ground layer contained species such as Garlic mustard, wood nettle, aster species, goldenrod species, red raspberry, sedge species and spotted touch-me-not.	Feature 8 is located adjacent to Kemp Road East, extending south and is connected to a small hedgerow. The surrounding land use includes active agriculture and residential.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A hedgerow extends from the south portion of the woodland.
wo11	0.23	CUP1-4 Hybrid Poplar Deciduous Plantation Type	This community is heavily influenced or maintained by cultural or anthropogenic-based disturbances. This cultural plantation is composed predominantly of hybrid poplar species.	This community is located adjacent to Walker Road. The woodland is surrounded by agricultural land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo14	9.25	FOD9-3 Fresh-Moist Bur Oak Deciduous Forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.	Feature 14 is located northwest and directly adjacent to Thirty Road and Mud Street intersection. A watercourse extended along the north portion of the woodland feature.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
		CUW1-5* Bur Oak Mineral Cultural Woodland	This community is dominated by bur oak in the canopy with black walnut and bur oak in the sub canopy, ground cover includes teasel, goldenrods and grasses.			
wo15	14.14	FOD5-5 Dry - Fresh Sugar Maple - Hickory Deciduous Forest	The Deciduous Forest communities in this area are dominated by sugar maple with bitternut hickory, swamp white oak and basswoood. The understorey is generally of similar composition with hop hornbeam, black cherry, white ash and prickly ash as common associates. Ground layer typically consists of garlic mustard, running strawberry-bush, herb robert and enchanter's nightshade.	Feature 15 is located on the north side of Mud Street, and is surrounded by agricultural and residential land use.	Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo16	1.39	FOD9-4 Shagbark Hickory Deciduous Forest	The edge of this deciduous forest was inventoried from Walker Road. The canopy and sub-canopy are dominated by Shagbark Hickory. Bur Oak is abundant in the sub-canopy and occasional in the understory. Gray Dogwood, Hawthorn and Prickly Ash are abundant at the outer edge of the forest. The ground layer of this forest community was not visible due to the thick understory shrubs at the edge of the forest.	Feature 16 is located on the east side of Walker Road and surrounded by agricultural and residential land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A hedgerow extends from the north portion of the woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo17	0.11	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	This small woodland is located on the east side of Thirty Road and located within an agricultural field.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.
wo18	0.07	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Feature 18 is a small woodland surrounded by residential and agricultural land use. This community is located adjacent to Thirty Road.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.
wo19	0.14	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Feature 19 is a small woodland surrounded by agricultural land use. This community is located adjacent to Thirty Road.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.
wo20	1.50	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Feature 20 is located adjacent to Thirty Road and bound by agriculture and a residential property.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo21	2.50	FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.	Feature 21 is located south of Fly Road and west of South Grimsby Road. This feature is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo22	50.21	FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.	Feature 22 extends across South Grimsby Road and is bound to the north by Fly Road. This large woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo23	0.09	FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.	This small woodland is located adjacent to Thirty Road and a residential property. Some evidence of disturbance to the feature was observed during site investigations.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.
		FOC2-2 Dry-Fresh White Cedar Coniferous Forest	This community was dominated by Eastern white cedar with some instances of white pine in the canopy. Ground vegetation was absent.			
wo24	3.75	FOD6-5 Fresh-Moist Sugar Maple Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 24 is located west of Thirty Road and surrounded by active agriculture.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo25	12.17	FOD2 Dry-Fresh Oak-Maple-Hickory Deciduous Forest	Red Oak is dominant in the canopy. Basswood is abundant in the canopy and sub-canopy. Shagbark Hickory occurs occasionally in the canopy and sub-canopy. The outer edge of the forest is composed of immature Trembling Aspen, White Ash and Sugar Maple, as well as Riverbank Grape, Staghorn Sumac and Gray Dogwood. The ground layer of this forest community was not visible due to distance.	The edge of this deciduous forest is approximately 75 metres from South Grimsby Road 3. The woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat, Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo26	0.69	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	Feature 26 is a small woodland extended across a railway track and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo27	0.84	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	Feature 27 is a long, narrow woodland extended along the south portion of a watercourse.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo28	0.24	FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous forest	This community was dominated by white ash, sugar maple and basswood in the canopy. Grasses were the most prevalent in the ground layer.	Feature 28 is located adjacent to South Grimsby Road 6 and a large watercourse intersecting the Municipal Road. North of the feature is predominantly active agriculture.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo29	0.06	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	This community is a long, narrow strip south of a large watercourse and west of South Grimsby Road 6. The feature abuts agricultural land on the west side.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo30	0.13	FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This community is dominated by Green ash and American elm in the canopy. Understory vegation includes Gray dogwood and hawthorn species. The ground layer is dominated by common milkweed and goldenrod species.	Feature 30 is located north of a large watercourse and east of South Grimsby Road 6.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo31	0.15	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	Feature 31 is located south of a large watercourse and east of South Grimsby Road 6.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo32	0.11	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this coomunity, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	Feature 32 is bound to the south by Municipal Road, and to the north by residential and agricultural land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
		CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.			
		CUT1-7*Tartarian Honeysuckle Cultural Thicket	Dominated by Tartarian honeysuckle in the understory layer, with some gray dogwood. The ground layer is dominated by Canada goldenrod, grasses and riverbank grape.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo33	1.27	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The dominant canopy species were sugar maple, red oak, and American beech, while the sub-canopy contained sugar maple, hop hornbeam and American beech. The understory consisted mostly of saplings of sugar maple and hop hornbeam. Panicled aster, avens, and raspberry species made up the ground layer. Complexed within this were a few small pockets of red maple mineral swamp.	This community extends along West Street to the north and a large watercourse to the south.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo34	1.16	FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak.	Feature 34 is a long, narrow woodland extending along a watercourse between South Grimsby Road 6 and West Street. Agricultural land use bound this feature to the south.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Linkages to other small woodlands.
wo35	176.13	FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak.	Feature 35 is a large woodland located east of Victoria Avenue and is surrounded predominantly by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Linkages to other small woodlands. A small portion of the woodland feature is located within the zone of investigation.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo36	14.86	FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest	The canopy consisted of species such as shagbark hickory, sugar maple, white oak, bur oak, red oak, and American basswood. The understory, consisted of sugar maple, shagbark hickory, bur oak, and white ash, with black locust and staghorn sumac. The ground layer was composed of sedges, with white avens, large-leaved avens, and creeping cinquefoil.	Feature 36 is located west of Turbine 80 and surrounded by agricultural land use. Some pockets of deep, saturated organic soil were found throughout. Contained with Upper Sixteen Mile Creek Wetland Complex. Adjacent habitat includes deciduous woodland.	Supported one amphibian species, one individual observed during call counts (Gray Treefrog) Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Linkages to other small woodlands. Tractor paths were found within. Located adjacent to the Upper Sixteen Mile Creek Wetland Complex.
wo37	0.05	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This deciduous forest community was dominated by sugar maple with oak associated throughout the canopy cover.	Feature 37 is located west of Victoria Avenue and surrounded by agricultural land use. This woodland is within close proximity to woodland Feature 38.	Supported two amphibian species (Green Frog and Gray Tree Frog).	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Linkages to other small woodlands. Tractor paths were found within. Located adjacent to the Upper Sixteen Mile Creek Wetland Complex.
wo38	0.71	CUW1-3* Manitoba Maple Cultural Woodland Type	This community had a canopy consisting of Manitoba maple, white ash, Scots pine and white elm. The understory layer was made up of staghorn sumac, black raspberry and Virginia creeper, while the ground layer consisted of spotted touch-me-not, poison ivy, wood nettle and garlic mustard.	Feature 38 is located west of Victoria Avenue and surrounded by agricultural land use. This woodland is within close proximity to woodland Feature 37.	Supported two amphibian species (Green Frog and Gray Tree Frog).	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Linkages to other small woodlands. Tractor paths were found within. Located adjacent to the Upper Sixteen Mile Creek Wetland Complex.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo39	3.65	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	This woodland is located north of Townline Road. This community is surrounded by residential and agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge)
wo40	0.07	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	This small narrow woodland (hedgerow) extends north of Townline Road and is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated feature.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo41	0.20	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	Feature 41 is a small woodland that extends north and south of Townline Road. A small creek is located west of the woodland, and the feature is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD9 Fresh-Moist Bur Oak Deciduous Forest	These communities are dominated by variable mixtures of Shagbark hickory, Basswood, bur oak, sugar maple white oak and beech with black locust, shagbark hickory, bur oak and sumac in the understory. Ground cover included Canada goldenrod and grasses.			
wo42	0.19	FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	This community is dominated by willow trees in the canopy and is associated with riparian zones and creeks throughout the study area.	Feature 42 is located on the south side of Townline Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated feature.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo43	25.52	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.	Feature 43 is located west of Victoria Avenue and surrounded by agricultural land use. Tractor paths were found within the woodland feature. Located adjacent to the Upper Sixteen Mile Creek Wetland Complex. Some pockets of deep, saturated organic soil were found throughout.	Supported two amphibian species (Spring Peeper, Chorus Frog). Seventeen individuals were observed during call counts. Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo44	2.03	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	The community contained occasional pockets of vernal pool habitat, often with a buttonbush thicket swamp component. Depths of surface water at the time of the survey varied from 3- to 35 cm. Contained with Upper Sixteen Mile Creek Wetland Complex.	Supported two amphibian species (Spring Peeper and Gray Treefrog).	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo45	3.95	FOD2-2/SWD2-2 Dry-Fresh Oah-Hickory Deciduous Forest Complex with Green Ash Mineral Decidous Forest	Red oak was the dominant canopy cover in this communitiy, with Bur oak, green ash and shagbark hickory associates. The subcanopy included red oak, green ash and shagbark hickory, with an understory dominated by green ash, white elm and shagbark hickory saplings. Ground cover was not observed in this community.	Feature 45 is located east of Victoria Avenue and located adjacent to a residential area and agricultural land use. A watercourse transversed the woodland on the east side, abutting the residential area.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo46	13.36	FOD2-2/FOD7-2 dry-fresh oak-hickory deciduous forest complex with fresh-moist lowland ash deciduous forest	bur oak, red oak and white oak dominated this community in a variable mixture. Shagbark hickory and sugar maple were also present and were the dominant component of the understory. Ground cover included species of Goldenrod.	This community is located east of Victoria Avenue and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo47	22.72	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	Feature 47 is located west of Tober Road. This community is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated feature.
wo48	1.19	FOD9-3 /FOD7-2 Fresh-Moist Bur oak Deciduous forest complex with fresh-moist lowland ash deciduous forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.	Feature 48 is located adjacent to Victoria Avenue and surrounded by agricultural land use. This community is located within a close proximity to woodland Feature 50.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo49	11.68	FOD4-1 Dry to Fresh Beech Deciduous Forest	Dominated by Beech with other deciduous species including white ash present. The ground layer included Canada goldenrod and species of grasses and riverbank grape.	Feature 49 is located north of Sixteen Road. This woodland is transversed by a watercourse and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo50	7.28	FOD9-3 /FOD7-2 Fresh-Moist Bur oak Deciduous forest complex with fresh-moist lowland ash deciduous forest	Bur oak dominates in this community, with red oak and Pin oak as associates in the canopy. Sub canopy vegetation included Bur oak, red oak and trembling aspen. Understory vegetation was dominated equally by hawthorn, green ash and gray dogwood. Observed groundcover vegetation includes goldenrods and virginia creeper.	Feature 50 is located adjacent to Victoria Avenue and surrounded by agricultural land use. This community is located within a close proximity to woodland Feature 48.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo51	0.91	FOD4-4 Dry – Fresh Black Walnut Deciduous Forest	This community was located on an adjacent property and assessed from the edge. The most abundant canopy species was black walnut, with much lower abundances of Scotch pine and bur oak. The understory consisted mainly of gray dogwood. Ground vegetation could not be seen from the survey point. The community may have been a plantation but could not be ascertained from the road.	Feature 51 is located east of Comfort Road and surrounded by residential and agricultural land use.	Supported two amphibian species (Green Frog and Gray Tree Frog).	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo52	39.83	FOD9/SWD Fresh – Moist Oak – Maple – Hickory Deciduous Forest with a Deciduous Swamp Complex	This community was assessed from the edge, but it appeared to be a complex of FOD and SWD, with the swamp containing swamp maple and oak species. Canopy species in the forest consisted of sugar maple, shagbark hickory, swamp maple, and swamp oak. The understory was primarily made up of gray dogwood with lower abundances of choke cherry and nannyberry. Goldenrod, scarlet strawberry and garlic mustard were the most abundant species in the ground layer.	Feature 52 is located southwest of Turbine 56. This large woodland is surrounded by agricultural land use and adjacent to Fifteen Road.	Supported two amphibian species (American Toad, Gray Treefrog), 4 individuals identified during call counts Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Adjacent to a muncipal road and the Silverdale Wetland Complex.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo53	0.55	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.	Feature 53 is a small woodland located east of Victoria Avenue and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
		SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo54	0.08	FOD3-1 Dry-Fresh Poplar Deciduous Forest Type	Dominated by trembling aspen, this was an early successional community located along the portion of the hedgerow bordering the west boundary of the property.	Feature 54 is located within a hedgerow and surrounded by agricultural land use.	Supports four amphibian species: Spring Peeper (chorous), Chorus Frog (1 individual), Green Frog (3 individuals) and Gray Treefrog (chorus).	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics. Contained within the St. Anne's Slough Forest Wetland Complex.
wo55	13.33	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.	Feature 55 is located east of Port Davidson Road and surrounded by agricultural land use	No amphibian species were observed in the candidate habitat during site visits.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located adjacent

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		SWD1-1 Swamp White Oak Mineral Deciduous Swamp Type	This community was assessed from the edge of the agricultural field bordering this community, due to restricted property access. This community had abundant swamp white oak in the canopy cover, with Freeman's maple, red maple, red oak and green ash associates. Deep standing water within this community, with appearances of sensitive fern, blue-flag iris and sedge species within the ground cover.	agricultural land use.	Supports a deer congregation area.	to the St. Anne's Slough Forest Wetland Complex.
wo56	0.95	SWD2-2 Green Ash Mineral Deciduous Swamp Type	Surrounded shallow marsh community, with various pockets of saturated soil. Pockets of upland forest located along the southern boundary of this community. Dominated by green ash, Freeman's maple and red oak were occasional throughout the canopy cover.	Feature 56 is located within a hedgerow, surrounded by agricultural land use.	Supported three amphbian species (Spring Peeper, Gray Treefrog and Green Frog). Greater than 250 individuals were observed at this feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located adjacent to the St. Anne's Slough Forest Wetland Complex.
wo57	0.04	CUP3-2 White Pine Coniferous Plantation	Dominated by white pine, no ground cover is present in this community.	Feature 57 is a small isolated woodland located west of Mountain Road. This community is surrounded by agricultural land use.	None observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo58	9.47	FOD6-5/SWD3, SWT2-6 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest, Maple Mineral Deciduous Swamp and Meadowsweet Mineral Thicket Swamp Type Complex	This community is an intricate complex, composed of three community types. A sugar maple-hardwood dominated forest, with basswood, oak and hickory associates were mixed within a maple dominated swamp. A complex of meadowsweet swamp thicket occurs throughout.	Feature 58 is located east of Victoria Avenue and intersected by Meter Road. A watercourse transverses the southern portion of the woodland feature. This community is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo59	0.04	FOD1-1 Dry-Fresh Red Oak Deciduous Forest Type	Upland community with predominantly red oak, white ash and American beech located within the canopy cover. Ground cover was dominated by large-leaved aster. One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics.	Feature 59 is a small woodland located within the St. Anne's Slough Forest Wetland Complex.	Supported three amphbian species (Spring Peeper, Gray Treefrog and Green Frog). Greater than 250 individuals were observed at this feature. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located within the St. Anne's Slough Forest Wetland Complex.
wo60	0.02	SWD2-2 Green Ash Mineral Deciduous Swamp	This community was a mature swamp with dense vegetation layers. It was assessed from the roadside. The most abundant canopy species were green ash, swamp white oak, and swamp maple. Gray dogwood, green ash and narrow-leaved meadowsweet were the most abundant understory species, while grasses, impatiens species, and white avens made up the ground cover.	Feature 60 is a small isolated woodland.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo61	12.14	FOD9 Fresh-Moist Bur Oak Deciduous Forest	These communities are dominated by variable mixtures of Shagbark hickory, Basswood, bur oak, sugar maple white oak and beech with black locust, shagbark hickory, bur oak and sumac in the understory. Ground cover included Canada goldenrod and grasses.	Feature 61 is located east of Crown Road and north of Concession 4. This woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		SWT2-9 Gray Dogwood Mineral Thicket Swamp	Gray dogwood dominates the understory in this community. Canopy species are rare to ocassional and include bur oak, white elm and shagbark hickory.			
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this coomunity, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.			
wo62	92.13	FOD - Deciduous Forest	A variety of tree species are present in the canopy and sub-canopy. No species are dominant. Basswood and White Ash are abundant. Shagbark Hickory, Bur Oak and Sugar Maple occur occasionally. Black Walnut, Black Cherry and planted Scots Pine occur rarely. The understory is dominated by Prickly Ash, Gray Dogwood and Riverbank Grape. What could be seen of the ground layer, Woodland Strawberry is abundant. Running Strawberry-bush, Garlic Mustard, Lance-leaved Aster, Canada Goldenrod and Jumpseed occur occasionally.	Feature 62 is a large woodland feature located between Mountain Road and Port Davidson Road to the east and west; and bound by Sixteen Road and Concession 4 to the north and south.	Supports woodland breeding amphibian habitat Supports a deer congregation area Supports woodland raptor nesting and interior habitat for area sensitive breeding birds.	Feature 62 provides 7.5 ha of woodland interior habitat (4ha greater than 200m from the edge).
wo63	105.00	FOD/SWD Deciduous Forest / Deciduous Swamp Complex	This complex is the dominant vegetation type within this portion of the St. Ann's Slough Forest Wetland Complex. The interior of this community was not visible and ELC was only conducted from the edge. Canopy species observed included freeman's maple, white elm, sugar maple and black cherry.	Feature 63 is located north of Concession 4 and transversed by a watercourse. This community is surrounded by agricultural land use	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the St. Ann's Slough
		SWD1 Oak Mineral Deciduous Swamp	This small community is adjacent to Concession 4. The canopy is dominated by both bur and white swamp oak. The canopy becomes denser beyond 120m from the road. The shrub layer consists of buttonbush, willow and meadowsweet species. The ground layer is dominated by sedges, reed canary grass and goldenrod.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		CUW1-3 Mixed Deciduous Cultural Woodland	This small, cultural community is adjacent to Concession 4 and is dominated by ash sp., bur oak and sugar maple in the canopy. The groundlayer in this community has been mowed.	by agricultural land use.		Forest Wetland Complex.
		CUW1-4 Green Ash Mineral Cultural Woodland	This small, cultural community is adjacent to Concession 4 and is dominated by green ash, bur oak and white elm in the canopy. The groundlayer in this community has been maintained in the past and consists of solidago sp., reed canary grass and st. anne's lace.			
wo64	0.04	FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	This community is dominated by willow trees in the canopy and is associated with riparian zones and creeks throughout the study area.	Feature 64 is a small woodland located north of Hodgkins Road. The community is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland located adjacent to a muncipal road.
wo65	0.03	FOM Mixed Forest	This community has a variety of species mixed throughout the canopy cover, with greater than 25% of both coniferous and decidious species composition.	Feature 65 is located west of McCollum Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo66	39.74	SWD3-3 Swamp Maple Mineral Deciduous Swamp	Swamp maple, green ash, and swamp white oak made up the canopy in this mature community. The understory was composed in large part of buttonbush and narrow-leaved meadowsweet, with occasional swamp maple saplings. The buttonbush was densest in areas where surface pools existed, as is typical of such communities. Sensitive fern, northern water horehound, and touch-me-not species made up the ground layer.	One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics. Contained within the St. Anne's Slough Forest Wetland Complex.	Supported four amphbian species (Spring Peeper, Chorus Frog, Gray Treefrog and Green Frog). Greater than 250 individuals were observed at this feature. Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo67	86.76	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.	Feature 67 is located south of Turbine 56 and transversed by a watercourse, rail line and Concession 4. This woodland is surrounded by agricultural land use.	Suppported two amphibian species (Green Frog, Gray Treefrog). Six individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Silverdale Wetland Complex.
		CUP3-2 White Pine Coniferous Plantation	Dominated by white pine, no ground cover is present in this community.			
		CUP3-1 Red Pine Coniferous Plantation	This community included a plantation of red pine which was unmaintained, other species present included white spruce, white pine and green ash.			
wo68	40.72	SWD/SWT2-4 Deciduous Swamp/ Buttonbush Mineral Thicket Swamp Complex	This complex is the dominant vegetation type within this portion of the St. Ann's Slough Forest Wetland Complex. The deciduous swamp portion is dominated by green ash, red maple and swamp white oak in the relatively dense canopy. Dogwood species and meadowsweet occupy the the shrub layer with reed canary grass and goldenrod species in the ground layer. Buttonbush thickets were scattered throughout the community. The communitybecomes more mature away from the road and moving westwards.	Feature 68 is located north of Concession Road 4 and within close proximity of woodland Feature 66. This	Supported three amphbian species (Spring Peeper, Gray Treefrog and Green Frog). Greater than 250 individuals were observed at this feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		FOD9 Fresh - Moist Maple - Hickory Deciduous Forest	This community type consists of 2 small pockets of vegetation within the St. Ann's Slough Forest Wetland Complex that are directly adjacent to Concession 4. The canopy consists of maple and oak species with the occasional shagbark hickory. Very little vegetation exists in the shrub layer and ground cover is varies between non-existent in one community and relatively dense with forbs and grasses in the other which also contains a SWT2-4 inclusion adjacent to Concession 4.	Feature 66. This woodland is surrounded by agricultural land use.	at this feature. Supports a deer congregation area.	edge). Contained within the St. Ann's Slough Forest Wetland Complex.
		FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo69	250.05	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	This community occupies approximately the southwestern third of the property. The most abundant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The moderately thick understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. Soils were variable through the community, with a clay dominated soil in some areas and a sandier, siltier component in others. Mottles were present within 17cm and 25 cm of the surface respectively for each type. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools (5 - 10cm) with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	Feature 69 is a large woodland located east of Regional Road 20. This feature is transversed by a watercourse. Soils were variable through the community, with a clay dominated soil in some areas and a sandier, siltier component in others. Small swamp pockets containing shallow pools (5 -10cm) with a closed canopy overhead were present within the rare vegetation community.	Supported five amphibian species (Spring Peeper, Chorus Frog, Green Frog, Bullfrog, Northern Leopard Frog). Greater than 230 individuals were observed during call counts. Supports a deer congregation area. Supports woodland raptor nesting and woodland area sensitive breeding bird habitat.	Provides 19 ha of woodland interior habitat (200 m from the edge) and breeding bird interior habitat (200 m from edge). Large woodland is located within close proximity to other woodland and wetland features. One rare vegetation community was identified within the woodland: FOD6-5/SWD1-2.
wo70	0.14	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	Feature 70 is located east of Port Davidson Road and west of rail line.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo71	1.06	FOD6-5 Fresh-Moist Sugar Maple Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 71 is located south of Feature 70, bound by a rail line and Port Davidson Road. This woodland abuts a watercourse to the east.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo72	0.09	SWD2-2 Green Ash Mineral Deciduous Swamp	This community was a mature swamp with dense vegetation layers. It was assessed from the roadside. The most abundant canopy species were green ash, swamp white oak, and swamp maple. Gray dogwood, green ash and narrow-leaved meadowsweet were the most abundant understory species, while grasses, impatiens species, and white avens made up the ground cover.	Feature 72 is a small woodland located west of Turbine 58 and is surrounded by agricultural land use. This woodland feature is isolated within the agricultural field.	None observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland surrounded by agricultural use.
wo74	1.56	FOD6-5/SWD2-2Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complexe of Green Ash Swamp	Dominant species were red and white oak with sugar maple. The sub-canopy consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. Complexed within this community was a green ash mineral deciduous swamp.	Feature 74 is located north of Regional Road 20 and surrounded by agricultural land use.	No amphibian species were observed in the candidate habitat during site visits. Supports a deer congregation area Supported winter raptor species (Turkey Vulture, Red-tailed Hawk, American Kestrel, Sharp shinned-Hawk). A total of 15 individuals were observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Supports winter raptor roosting habitat. Located adjacent to the Silverdale Wetland Complex and woodland Feature.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo75	0.09	CUP3-3 Scotch Pine Cultural Plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.	Feature 75 is located south of Concession 4. This community is surrounded by agricultural and residential land use.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo76	0.09	CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	Feature 76 is located south of Concession 4. This community is surrounded by agricultural and residential land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo77	0.10	FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	This community is dominated by willow trees in the canopy and is associated with riparian zones and creeks throughout the study area.	Feature 77 is located south of Concession 4. This community is surrounded by agricultural and residential land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo78	0.06	FOD3-1 Dry to Fresh Poplar Deciduous Forest	Tembling aspen is the dominant vegation in the canopy, sub-canopy and understory in this community. Ground cover included goldenrod species and phragmites.	This small woodland feature is located west of Silverdale Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo79	0.99	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	This small woodland feature is located southwest of turbine 59 and surrounded by agricultural land use. Feature 79 is isolated within the agricultural field. The soils were clay with mottles and the water table present at 30cm. This community followed a drainage feature but did not contain any water at the time of the survey.	No amphibian species were observed in the candidate habitat during site visits. Supported winter raptor species (Turkey Vulture, Red-tailed Hawk, American Kestrel, Sharp shinned-Hawk). A total of 15 individuals were observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Supports winter raptor roosting habitat. Located adjacent to the Silverdale Wetland Complex and woodland Feature.
wo80	20.97	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species.	Feature 80 is located between Turbine 4 and Turbine 58 and adjacent to a rail line to the south. This woodland is surrounded by agricultural land use. A rare vegetation community was identified directly adjacent to the woodland feature (SWT2-4 Buttonbush Mineral Thicket Swamp).	No amphibian species were observed in the candidate habitat during site visits. Supports a deer congregation area Supported winter raptor species (American Kestrel, Merlin, Northern Harrier, Northern Shrike, Red-tailed Hawk, Short-eared Owl, Turkey Vulture) A total of 28 individuals were observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Supports winter raptor roosting habitat. A Buttonbush Minearl Thicket Swamp (rare vegetation community) was identified directly west of the woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo81	0.19	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	Feature 81 is located east of Regional Road 20 and surrounded by agricultural land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo82	27.82	FOD3-1 Dry to Fresh Poplar Deciduous Forest	Canopy species occurring in this community included Cottonwood species, Trembling aspen, White Ash, Green Ash, Willow species, Sugar maple, American basswood and Red oak . The sub-canopy included Sugar maple, Trembling aspen and Cottonwood species. The understory was comprised of species such as Staghorn sumac, Spicebush, Sugar maple, Trembling aspen, virginia creeper and Gray dogwood, while the ground layer contained Currant species, Spicebush, Tall goldenrod, Canada goldenrod, Wood nettle, Poison Ivy and Sensitive fern.	This large woodland feature is located north of Regional Road 20 and west of Silverdale Road. The woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo83	76.37	SWD/FOD Deciduous Swamp with Deciduous Forest Inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.	This large woodland is located south of Concession 4 and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo84	0.36	CUW Cultural Woodland	This community results from, or maintained by, cultural or anthropogenic-based distubances.	Feature 84 is a small woodland located east of Rosedene Road and surround by agricultural land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). An isolated, small woodland.
wo85	7.68	FOD5-2a Dry-Fresh Sugar Maple – American Beech Deciduous Forest Type	This community was upland, with dry soils and no areas of standing or pooling water. Dominated by sugar maple and American beech, various canopy associates including trembling aspen, shagbark hickory, ironwood and black cherry occurred throughout. Blue cohosh, nettles, wild ginger and goldenrods occurred throughout the ground layer.	Feature 85 is located adjacent to Turbine 93 and abuts woodland Feature 92. No surface water was present, although portions of this community occurring on adjacent lands (no access) appear to have the potential for seasonal flooding.	Supported three amphibian species (Green Frog, Gray Treefrog and Northern Leopard Frog). Greater than 110 individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located adjacent to woodland Feature 92.
		FOD5-2b Dry-Fresh Sugar Maple – American Beech Deciduous Forest Type	This community was upland, with dry soils and no areas of standing or pooling water. Dominated by sugar maple and American beech, with little to no associates occurring within the canopy. True Solomon's seal, blue cohosh, poison ivy and garlic mustard occurred throughout the ground layer.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo86	4.21	FOD/SWD2-2 Deciduous Forest/Green Ash Mineral Deciduous Swamp,	The canopy cover was dominated by green ash, with red maple and American elm associates. Shallow pools of water were observed throughout. Raspberry was found commonly within the understory. A large variety of herbaceous species were observed within the ground layer, including goldenrods, grasses and sedge species. This community alternated with upland and lowland terrain.	Feature 86 is located north of Regional Road 20 and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community occasionally contained sparse Red maple and ash species in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Highbush Blueberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Beggar-ticks, Fern species, Sedge species, Grass species and Duckweed.			
		MAM2-2 Reed Canary Grass Mineral Meadow Marsh	Reed Canary grass is the dominant cover in this community. Other species include cattails, goldenrod species and gray dogwood.			
wo87	0.36	CUW Cultural Woodland	This community results from, or maintained by, cultural or anthropogenic-based distubances.	Feature 87 is a small, disturbed, isolated woodland located east of Rosedene Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small isolated and disturbed woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo88	41.56	FOD5-4 Dry-Fresh Sugar Maple-Ironwood Deciduous Forest	The canopy in this forest is composed of sugar maple, red oak, bur oak and shagbark hickory. The sub-canopy is dominated by ironwood with very few white elm occuring close to feature edge. Understory vegetation is comprised of white ash and blue beech with rarely witchhazel. the ground layer was sparse, consisting of mainly grasses and young trees. Community likely disturbed by grazing in the past.	Feature 88 is a large woodland located east of Turbine 81. This feature is surrounded by agricultural land use.	Supported three amphibian species (Spring Peeper, Chorus Frog, Green Frog). Six individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located adjacent to woodland Feature 91 and the St. Annes Slough Forest Wetland Complex.
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community occurred in two locations along the property boundary, the understory is composed of buttonbush in much higher proportions than meadowsweet, which is also a component. The ground layer is heavily dominated by lakebank sedge, with smartweed species and woolgrass also occuring.			
wo89	12.73	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this coomunity, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	Feature 89 is located east of Wilton Road and transversed by a rail line and watercourse. This woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located adjacent to woodland Feature 91 and the St. Annes Slough Forest Wetland Complex.
wo90	0.06	CUP1-1 Sugar maple Dedicuous Plantation	This community is dominated by sugar maple, ground cover has been mown and is unidentifiable.	This small woodland feature is surrounded by agricultural land use.	None observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo91	19.27	SWT3-4 Buttonbush Organic Thicket Swamp	This community had a canopy composed mainly of eastern buttonbush and winterberry. The sub-canopy was composed of narrow-leaved meadowsweet, while sensitive fern was the sole species found in the understory.	Feature 91 is located west of Turbine 81 and surrounded by agricultural land use.	Supported five amphibian species (Spring Peeper, Chorus Frog, Green Frog, Bullfrog, Woodfrog). Eight individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located within the St. Annes Slough Forest Wetland Complex.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.			
		FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo92	2.46	FOD5-2 Dry-Fresh Sugar Maple – American Beech Deciduous Forest Type	This community was upland, with dry soils and no areas of standing or pooling water. Dominated by sugar maple and American beech, various canopy associates including trembling aspen, shagbark hickory, ironwood and black cherry occurred throughout. Blue cohosh, nettles, wild ginger and goldenrods occurred throughout the ground layer.	Feature 92 is located within close proximity to other woodland and wetland features. A watercourse transverses through the woodland.	Supports woodland breeding amphibian habitat. Supports a deer congregation area. Supports snake hibernacula habitat.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo93	1.23	CUW1-5* Bur Oak Mineral Cultural Woodland, OA	This community is dominated by bur oak in the canopy with black walnut and bur oak in the sub canopy, ground cover includes teasel, goldenrods and grasses.	Feature 93 is located north of Regional Road 20 and surrounded by residential and agricultural land use.	None observerd from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated and disturbed woodland.
wo94	0.11	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.	Feature 94 is located north of Regional Road 20 and surrounded by deciduous swamp communities.	None observerd from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.
wo95	0.16	FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	This community could not be thoroughly surveyed. Canopy species observed included Norway maple, sugar maple, and red oak. An inclusion of a deciduous swamp was identified within the above community	Feature 95 is located south of Regional Road 20 and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo96	1.32	CUW1/CUM Mineral Cultural Woodland with a Cultural Meadow inclusion	Species included swamp maple, green ash and trembling aspen. There was a dense understory of gray dogwood, swamp maple, and narrow-leaved meadowsweet, and a ground layer of Kentucky bluegrass, creeping cinquefoil, scarlet strawberry, and goldenrod.	Feature 96 is located south of Regional Road 20. This woodland is transversed by a watercourse and surrounded by agricultural and residential land use.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo97	53.36	FOD9-2/SWD1-2 Fresh – Moist Oak – Maple Deciduous Forest with a complex of Bur Oak Mineral Deciduous Swamp	The canopy contained red oak, white oak, sugar maple and red maple as dominants. Red oak, sugar maple, American beech, and white oak made up the sub-canopy. The understory consisted of blue beech, American beech, sugar maple and hop hornbeam, while sedges, goldenrod, large-leaved aster and avens made up the ground layer. Complexed within this forest was a bur oak mineral deciduous swamp. Some portions of the swamp complex were more dominated by red maple or green ash with some younger oaks in lower proportions.	Feature 97 is a large woodland located east of Turbine 18. The moisture regime was variable throughout the community but fell between 4 and 6 due to the location of the mottles in the soil profile. In some areas the soils were clay dominated and had a moisture regime of 6, in others there was a higher sand content and mottles at 40cm. There was evidence of logging and recreational activities taking place within the community and its complex. Water was present within the ditch, ranging from 5 to 20cm deep. Adjacent land use includes active agriculture and a railine.	Supported three amphibian species (Spring Peeper, Chorus Frog, Green Frog), Greater than 230 individuals were identified during call counts Supports a deer congregation area. Supported winter raptor species (Red-tailed Hawk, Northern Shrike, Northern Harrier). A total of 5 individuas were observed. Supported woodland raptor species.	Provides 6.04 ha of woodland interior habitat and breeding bird interior habitat (200 m from edge). Provides winter raptor roosting habitat. Contained within the Highway 20 and 24 Wetland Complex.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo98	11.84	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 98 is located north of Turbine 2. A watercourse transverses through a portion of the woodland and the feature is primarily surrounded by agricultural land use.	Supported three amphibian species (Spring Peeper, Chorus Frog, Green Frog). Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Located within the Silverdale Wetland Complex.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			
wo99	29.01	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 99 is located east of Turbine 53 and surrounded by agricultural land use. At the time of the survey there were pools of surface water of up to about 2ft deep covering approximately 70% of the land area within the SWD.	Supported one amphibian species (Spring Peeper) Thirteen individuals were observed during call counts. Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Upper Beaver Creek Wetland Complex.
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo100	11.26	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	The canopy consisted of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated the ground layer. There was a swamp maple swamp complex within the community.	Feature 100 is located northeast of Turbine 31 and within close proximity to woodland Feature 101. This woodland is surrounded by agricultural land use.	Supported two amphibian species (Spring Peeper and Gray Treefrog). Five individuals were observed during call counts. Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex. Adjancent land use includes active agriculture.
wo101	1.75	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.	Feature 101 is located northwest of Turbine 31. This woodland is transversed by a watercourse and surrounded by agricultural land use.	Supported two amphibian species (Spring Peeper and Gray Treefrog). Five individuals were observed during call counts. Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex. Adjancent land use includes active agriculture.
		SWT2-4 Buttonbush Mineral Thicket Swamp	This community occasionally contained sparse Red maple and ash species in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Highbush Blueberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Beggar-ticks, Fern species, Sedge species, Grass species and Duckweed.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo102	27.55	FOD5-11* Fresh-Moist Sugar Maple-Oak-Beech Deciduous Forest	The most abundant canopy species in this community were sugar maple and white oak with American beech. The understory consisted of sugar maple, long-spined hawthorn, American beech and white oak. Sugar maple saplings were the most abundant ground vegetation along with red raspberry and poison ivy.	Feature 102 is located east of Turbine 76 and surrounded by agricultural land use.	Supported three amphibian species (Spring Peeper, Chorus Frog, Green Frog), Greater than 130 individuals were identified during call counts Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex. Adjancent land use includes active agriculture.
		FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.			
wo103	3.16	FOD Deciduous Forest	Canopy species observed included Norway maple, sugar maple, and red oak.	Feature 103 is located north of Turbine 1 and Turbine 76. The woodland is transversed by a watercourse and surrounded by agricultural land use.	Supported four amphibian species (Spring Peeper, Chorus Frog, American Toad, Gray Tree Frog), Greater than 180 individuals were identified during call counts Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Surrounded by active agriculture and located adjacent to the Beaver Creek Wetland Complex.
wo104		FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 104 is located east of Turbine 2 and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		SWD Deciduous Swamp	Assessed from the roadside, this swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access			
		CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	Feature 105 is located outside of the zone of investigation, east of	Supports woodland breeding amphibian	Does not provide woodland interior habitat (200 m from

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo105	16.45	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Regional Road 27 and north of Vaughan Road. This woodland is surrounded by agricultural land use.	habitat. Supports a deer congregation area.	interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo106	10.62	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	Dominant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	Feature 106 is located between Turbine 54 and Turbine 38. This woodland is adjacent to a watercourse and surrounded by agricultural land use.	Supported five amphibian species (Spring Peeper, Chorus Frog, Northern Leopard Frog, Gray Treefrog and American Toad). Greater than 90 individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo107	4.03	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	This community is found within the Beaver Creek PSW Complex to the south and east of the proposed turbine location. The canopy of this community is dominated by red oak followed by swamp white oak, shagbark hickory and American elm. The sparse understorey is dominated by red ash saplings followed by sugar maple saplings and chokecherry. Ground cover vegetation is dominated by large-leaved aster, spotted jewelweed and smooth blackberry.	Feature 107 is located south of Turbine 97. There were numerous shallow pools throughout. Adjacent habitat includes shallow marsh and deciduous thicket.	Supported four amphibian species (Spring Peeper, Chorus Frog, American Toad, Gray Treefrog). Five individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex.
wo108	80.98	FOD9 Fresh-Moist Bur Oak Deciduous Forest	These communities are dominated by variable mixtures of Shagbark hickory, Basswood, bur oak, sugar maple white oak and beech with black locust, shagbark hickory, bur oak and sumac in the understory. Ground cover included Canada goldenrod and grasses.	Feature 108 is a large woodland extending north and south of Vaughan Road. This woodland is surrounded by agricultural land use and transversed by a watercourse. There were numerous shallow pools throughout. Adjacent habitat includes shallow marsh and deciduous thicket.	Supported five amphibian species (Spring Peeper, Chorus Frog, Green Frog, Gray Treefrog and American Toad). Twenty one individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex and within the Highway 20 nd 24 Wetland Complex.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			
wo109	4.24	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 109 is located south of Vaughan Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo110	0.05	CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.	This small woodland feature is located west of Regional Road 27 and surrounded by agricultural land use.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated woodland feature.
wo111	20.77	FOD6-5/SWD2-2/MAS2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp and Broad-leaved Sedge Shallow Marsh	Dominant species were red and white oak with sugar maple. The sub-canopy consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. Complexed within this community were two wetland communities – green ash mineral deciduous swamp and broad-leaved sedge shallow marsh. Most of the swamp pockets had pools of water and abundant emergent vegetation.	This community is located adjacent to Turbine 8. There were cut stumps throughout the community indicating it had undergone logging in the past. Most of the swamp pockets had pools of water at least 20cm deep and abundant emergent vegetation.	Supported four amphibian species (Spring Peeper, American Toad, Green Frog, Gray Treefrog). Approximately 45 individuals were observed during call counts. Supports deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo112	17.45	FOD6-5/SWT2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Buttonbush Mineral Swamp Thicket	The dominant canopy species were sugar maple, red oak, and shagbark hickory, and there was a sub-canopy consisting of sugar maple, hop hornbeam, American beech, and blue beech. There was no evident understory shrub layer. The ground vegetation consisted primarily of sugar maple, blackberry species, and large-leaved aster. The community contained an inclusion of shallow marsh dominated by a barnyard grass species. There was also a complex of buttonbush mineral thicket swamp, confined mostly to the southeastern half of the community.	Feature 112 is located south of Vaughan Road and north of Turbine 32. In general the ground was very moist, with frequent puddling observed. There were several meadowsweet mineral thicket swamps distributed throughout. The grounds may be an old or active research site of some sort. Located within the Beaver Creek Wetland Complex. Adjacent habitat includes cultural meadow and deciduous swamp.	Supported fiver amphibian species (Northern Leopard Frog, Chorus Frog, American Toad, Green Frog, Gray Treefrog). Greater than 80 individuals were observed during call counts. Supports deer congregation area. Supported shrubland breeding bird candidate habitat; however, nesting or breeding of 1 of the indicator species and at least 2 of the common species was not observed during field investigations.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex. Rare vegetation community identified on the north portion of the woodland (FOD6-5/MAS2-10*/SWT2-4).
wo113	26.79	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 113 is located along the east side of Turbine 78, access road and collector line. This woodland is surrounded by agricultural land use. Contained within the Highway 20 and 24 Wetland Complex. Some evidence of disturbance could be seen throughout the site in the form of light logging activities and installation of drainage pipes within areas of the swamp complex.	Supported five amphibian species (Spring Peeper, Chorus Frog, Green Frog, Gray Treefrog, Bullfrog) Greater than 150 individuals were observed during call counts. Supports deer congregation area. Winter raptor habitat adjacent to woodland feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo114	2.85	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature 114 is located north of Turbine 34. This woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo115	21.21	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	Feature 115 is located south of Vaughan Road and surrounded by agricultural land use.	Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo116	3.78	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Feature 116 is located east of T55. This community included small pockets of meadow marsh adjacent to the FOD9-1 and is surrounded by agricultural fields. There was some surface water over approximately one-quarter of the interior of the community. Contained within the Beaver Creek Wetland Complex.	Supported two amphibian species (American Toad, Gray Treefrog). Seven individuals were observed during call counts. Supportes candidate snake hibernacula.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Candiate snake hibernacula observed within the woodland. Contained within the Beaver Creek Wetland Complex.
wo117	1.46	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	This community is located west of Turbine 55 and linked to woodland feature 121 by a small hedgerow. This was a small, linear community associated with a drainage ditch/creek that traverses the property. The forest inclusion was located on a patch of higher ground sloping eastwards within the same community.	Supported one amphibian species (Chorus Frog). Ten individuals were observed during call counts.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo118	3.00	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	This feature is located east of a railline and intersected by Port Davidson Road. The woodland is surrounded by agricultural land use.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		CUW1-3*/CUM1-1 Manitoba Maple Cultural Woodland Type with a Dry-Moist Old field cultural meadow inclusion	This community had a canopy consisting of Manitoba maple, white ash, Scots pine and white elm. The understory layer was made up of staghorn sumac, black raspberry and Virginia creeper, while the ground layer consisted of spotted touch-me-not, poison ivy, wood nettle and garlic mustard.			
wo119	6.86	FOD4-1 Dry to Fresh Beech Deciduous Forest	Dominated by Beech with other deciduous species including white ash present. The ground layer included Canada goldenrod and species of grasses and riverbank grape.	Feature 119 is located south of Turbine 75. This woodland is transversed by a watercourse and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area. Supported winter raptor species (Northern Harrier, Northern Shrike, Red-tailed Hawk, Short-eared Owl, Great-horned Owl). A total of 10 individuals were observed.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Supports winter raptor roosting habitat.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo120	0.09	SWD4-1 Willow Mineral Deciduous Swamp	Dominant canopy species were Crack willow, black willow and white willow, with green ash and red maple. Less common canopy species included swamp white oak and bur oak. Sub-canopy species included crack willow, black willow, swamp white oak and manitoba maple. The understory consisted of species such as red-osier dogwood, rough-leaved dogwood, eastern buttonbush, common elderberry, wild red raspberry and narrow-leaved meadowsweet. The ground vegetation layer contained species such as cattail, riverbank grape, virginia creeper, tall goldenrod, bitter nightshade, jewelweed and reed-canary grass.	This small woodland feature is located south of T32 and surrounded by agricultural land use.	Supported one amphibian species (Gray Treefrog). Two individuals were observed during call counts.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo121	29.59	SWD/FOD Deciduous Swamp with Deciduous Forest Inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.	This woodland is located west of T55 and within close proximity to woodland Feature 117. This woodland abuts Elcho Road at its most southern point, and is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo122	2.77	FOD9-1/SWT2-4/SWD1-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Buttonbush Mineral Thicket Swamp inclusion and a Bur Oak Mineral Deciduous Swamp complex	This community had a canopy consisting of White oak, Red oak, Sugar maple and White pine. The sub-canopy contained Hop hornbeam, Blue beech and White pine, while the understory consisted largely of Black cherry, Blue beech, Hop hornbeam and White pine. The ground layer included Sedge species, Large-leaved aster and Millspaugh's blackberry. A Buttonbush Mineral Thicket Swamp occurred within this community and was added as an inclusion. The primary species here included Eastern buttonbush, Winterberry, Red-osier dogwood and Narrow-leaved meadow sweet. Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well.	Feature 122 is located west of Turbine 39 and surrounded by agricultural land use. Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well, with pools of surface water up to 60cm in depth. The soils in this Oak-Sugar maple deciduous forest community had a moisture regime of 5-6.	Supported one amphibian species (Spring Peeper). One individual was observed during call counts. Supported shrub breeding bird habitat (list species)	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex.
wo123	0.57	FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous forest	This community was dominated by white ash, sugar maple and basswood in the canopy. Grasses were the most prevalent in the ground layer.	Feature 123 is located north of Turbine 7 and is transversed by a watercourse. This woodland is surrounded by agricultural land use.	Supported four amphibian species (Spring Peeper, Chorus Frog, American Toad, Gray Treefrog). Approximately 25 individuals were observed during call counts.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex.
wo124	4.10	FOD9-6* Fresh-Moist Hickory-Ash-Oak-Elm Deciduous Forest Type	This community was assessed from the property line due to restricted property access. This community was composed of shagbark hickory, green ash, bur oak and American elm.	Feature 124 is located east of Turbine 7 and is transversed by a drain. This woodland is surrounded by agricultural land use.	Supported four amphibian species (Spring Peeper, Chorus Frog, American Toad, Gray Treefrog). Greater than 100 individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Contained within the Beaver Creek Wetland Complex.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo125	1.37	FOD9 Fresh-Moist Oak - Maple-Hickory Deciduous Forest	These communities are dominated by variable mixtures of Shagbark hickory, Basswood, bur oak, sugar maple white oak and beech with black locust, shagbark hickory, bur oak and sumac in the understory. Ground cover included Canada goldenrod and grasses.	Feature 125 is located north of Elcho Road and west of Regional Road 27. This small woodland feature is transversed by a watercourse and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo126	3.36	FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This community is dominated by Green ash and American elm in the canopy. Understory vegation includes Gray dogwood and hawthorn species. The ground layer is dominated by common milkweed and goldenrod species.	Feature 126 is located south of Elcho Road. This woodland is transversed by a watercourse and is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo127	2.78	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Feature 127 is located south of Elcho Road. This woodland is transversed by a watercourse and is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo128	1.35	CUP Cultural Plantation	This community results from, or maintained by, cultural or anthropogenic-based distubances.	Feature 128 is located north of Elcho Road and surrounded by residential and agricultural land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, disturbed woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo129	12.36	SWD3-3 Swamp Maple Mineral Deciduous Swamp with a FOD 6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest inclusion	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer. This community had a Fresh-Moist Sugar Maple-Hardwood Deciduous Forest inclusion.	Feature 129 is located south of Elcho Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo130	0.52	CUW1-5* White Elm Cultural Woodland	The sparse canopy of this woodland is dominated by American elm followed by black cherry, white ash and a hawthorn species. The understorey of this woodland is dense and dominated by grey dogwood and wild red raspberry followed by Tartarian honeysuckle and chokecherry. Ground cover is dominated by Kentucky blue grass followed by Canada goldenrod.	This small woodland feature is located north of Elcho Road and west of Regional Road 27. The woodland is transversed by a watercourse and surrounded by agricultural land use.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated and disturbed woodland.
wo131	0.04	CUW Cultural Woodland	This community results from, or maintained by, cultural or anthropogenic-based distubances.	This small woodland feature is located south of Elcho Road and within close proximity to woodland Feature 133. This community is surrounded by agricultural land use.	None observed from roadside survey.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). A small, isolated and disturbed woodland.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo132	20.73	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.	Feature 132 is located south of Elcho Road. The woodland is transversed by a watercourse and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo133	1.12	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	This small woodland feature is located south of Elcho Road and within close proximity to woodland Feature 131. This community is surrounded by agricultural land use and transversed by a watercourse. Water covered approximately 90% of the area at depths of up to 60cm.	Supported two amphibian species (Gray Treefrog and Green Frog). Two individuals observed during call counts.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo134	2.93	FOD9-2/SWD Fresh-Moist Oak-Maple Deciduous Forest with Deciduous Swamp Inclusion	This community is dominated by oak and maple within the canopy cover. Intricate complexes of deciduous swamp run through this community.	Feature 134 is located south of Elcho Road. This woodland is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo135	15.16	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.	Feature 135 is located south of Elcho Road and west of Turbine 74. This woodland is transversed by a watercourse and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat, Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD9-2/MAM2-2 Fresh-Moist Oak-Maple Deciduous Forest with Cattail Mineral Meadow Marsh Inclusion	This community is dominated by oak and maple within the canopy cover. Intricate complexes of caittail meadow marsh run through this community.			
		SWD2-2 Green Ash Mineral Deciduous Swamp Type	The canopy cover was dominated by green ash, with red maple and American elm associates. Shallow pools of water were observed throughout. Raspberry was found commonly within the understory. A large variety of herbaceous species were observed within the ground layer, including goldenrods, grasses and sedge species.			
wo136	5.35	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	This feature is south of Elcho Road, bordered by Port Davidson Road and Krick Road. The feature is transected by a watercourse.	Amphibian Breeding Habitat was identified adjacent to the candidate feature. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo137	1.93	CUW Cultural Woodland	This community results from, or maintained by, cultural or anthropogenic-based distubances.	Feature 137 is located east of Turbine 36. Water covered approximately 90% of the area at depths of up to 60cm.	Supported two amphibian species (Gray Treefrog and Green Frog). Two individuals observed during call counts.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD5 Dry-fresh Sugar Maple Deciduous Forest	Dominated by sugar maple, with occasional basswood and swamp maple.	This feature is located in proximity to turbine 29. Within this feature were	Supported two amphibian species (Spring Peeper,	Does not support breeding

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo138	23.66	FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This community is dominated by Green ash and American elm in the canopy. Understory vegation includes Gray dogwood and hawthorn species. The ground layer is dominated by common milkweed and goldenrod species.	small pockets of red maple mineral swamp, containing shallow pools of water of about 30cm in depth. Sucker Creek Wetland Complex contained within.	Chorus Frog). Twelve individuals observed during call counts. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo139	11.11	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	This feature has several shallow pools. At its southern edge, it sloped very steeply to the adjacent floodplain community. Contains the Beaver Creek Wetland Complex	Supported two amphibian species (Gray Treefrog and Green Frog). Three individuals observed during call counts. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo140	3.64	SWD2-2/SWT2-4/MAM2-2 Green Ash Mineral Deciduous Swamp with a complex of Reed-canary Grass Mineral Meadow Marsh and an inclusion of Buttonbush Mineral Swamp Thicket	The dominant vegetation was a canopy of green ash, multiple oak species, Freeman's maple, and hickory species. The sub-canopy consisted of younger green ash and white elm trees. The understory consisted mostly of dogwood species, narrow-leaved meadowsweet and eastern buttonbush. The ground layer was dominated by sedges, reed-canary grass, panicled-aster and smartweed species. There was also a complex of reed-canary grass mineral meadow marsh and an inclusion of buttonbush mineral thicket swamp.	This feature is transected by a watercourse and surrounded by agricultural land use.	Supported two amphibian species (Gray Treefrog and Green Frog). Three individuals observed during call counts.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo141	8.76	FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.	This feature has several shallow pools. At its southern edge, it sloped very steeply to the adjacent floodplain community. Contains the Beaver Creek Wetland Complex. The feature is traversed by a watercourse.	Supported two amphibian species (Gray Treefrog and Green Frog). Three individuals observed during call counts. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo142	84.24	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.	This feature is south of Elcho Road and west of Port Davidson Road. The eastern extent of this feature is bordered by a railroad, with the southern extent traversed by a watercourse. Pooled water of 5-20cm in depth was found throughout the feature. Adjacent habitat includes deciduous woodland, marsh and swamp located within the Port Davidson Slough Forest Wetland Complex.	Supported three amphibian species (Spring Peeper, Chorus Frog, Bullfrog). Approximately 85 individuals were observed during call counts. Supports a deer congregation area Supported woodland raptor species Supported marsh breeding bird species adjacent to the candidate feature.	Provides 7.65 ha of woodland interior habitat (200 m from the edge) and breeding bird interior habitat (200 m from edge). Supports Woodland Raptor nesting habitat and Woodland Area Sensitive Bird breeding habitat.
		SWT2-4 Buttonbush Mineral Thicket Swamp	Buttonbush is the dominant vegetation in this coomunity. Riverbank grape and virginia creeper are also present. The ground layer includes Reed Canary grass and duckweed species.			
		FOD9-1/SWD3-1/MAS2-4 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Red Maple Mineral Deciduous Swamp and Broad-leaved Sedge Mineral Shallow Marsh complex	This community had a canopy of Sugar maple, Red oak, White pine and Ash species. The sub-canopy contained Sugar maple, Hop hornbeam, Red oak and White oak. The understory consisted of Sugar maple, American Beech, Hop hornbeam and Blue beech, while the ground layer included Millspaugh's blackberry, Pennsylvania sedge, Maple-leaved viburnum and Wild red raspberry. Areas of Red Maple Deciduous Swamp and Broad-leaved sedge Shallow Marsh were found throughout the forest community and included as a complex.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo143	1.24	CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	This feature is a small, linear woodlot adjacent to the Welland River.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo144	16.48	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	This feature abuts Port Davidson Road, south of Zumstein Road. It is traversed by watercourses. It is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo145	15.15	CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	This feature is north of Creek Road adjacent to the Welland River. It is in close proximity to the large woodlot 150. Open water is located to the south of the woodlot.	Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			
wo146	1.54	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	This feature is adjacent to the Welland River. The land uses surrounding this woodlot are agricultural in nature.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo147	0.45	CUW1-4*Green Ash Mineral Cultural Woodland	Green ash dominates this community in the canopy and the understory with less than 60% cover. Riverbank grape, reed canary grass and goldenrod are present in the ground layer.	This feature is north of Creek Road, in close proximity to the large woodlot 150. It is a linear feature with watercourses bordering the eastern and western extents.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo148	0.53	CUP1-3 Black Walnut Deciduous Plantation	This plantation was dominated by mature black walnut, with rarely occurring sugar maple in the canopy. Ground cover was obstructed by residences.	The linear feature is adjacent to the Welland River, surrounded by agricultural land use.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo149		FOD9 Fresh-Moist Oak-Maple-Hickory Deciduous Forest	The edge of this large moist deciduous forest was inventoried from Mud Street and South Grimsby Road 3. The canopy is comprised of Bur Oak (abundant), Green Ash (occasional), Shagbark Hickory (occasional) and Swamp Maple (occasional). The sub-canopy is dominated by Green Ash. The same associates present in the canopy are present in this layer with the addition of White Elm. The understory is dominated by Prickly Ash with an abundance of White Elm, Riverbank Grape and Gray Dogwood. Visibility of the ground layer was limited from the road, but Poison Ivy and Lance-leaved Aster appeared abundant. Other species of occasional occurrence are Wild Red Raspberry, Smooth Rose and Canada Goldenrod.	Feature is located between Wellandport Road and Sideroad 42, north of Concession 6. It is in proximity to large woodlot 150.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		SWD3-2 Silver Maple Mineral Deciduous Swamp	This community is dominated by silver maple in the canopy with green ash and oak associates. Understory species were restricted to inclusion sites and otherwise sparse, species included buttonbush,high-bush blueberry and high-bush cranberry. Ground-cover was dominated by Reed-canary grass and sensitive fern, overall cover of these species was low.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo150	310.81	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.	This large feature is north of Concession 6, east of Sideroad 42. Watercourse traverses the southeast portion of the woodlot. It is in close proximity to several other woodlots. Contains the Chippawa Creek Slough Forest Wetland Complex	Supported four amphibian species (Spring Peeper, Chorus Frog, Green Frog, Gray Treefrog). Thirteen individuals were observed during call counts. Supports a deer congregation area Supported woodland raptor species	Provides 29.6 ha of woodland interior habitat and breeding bird interior habitat. Supports Woodland Raptor nesting habitat and Woodland Area Sensitive Bird breeding habitat.
		SWD 3-1 Red Maple Mineral Deciduous Swamp	The canopy of this community contained red maple with less frequent occurrences of American elm, green ash and trembling aspen. The sub-canopy composition was similar. The understorey included Red maple saplings, american elm, common buckthorn and riverbank grape. Ground cover included species such as cinnamon fern, sensitive fern, beggar ticks, Northern bugleweed and false Solomon's seal.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo151	32.15	SWD3-1/MAS2-9/SAF1-3 Red Maple Mineral Deciduous Swamp with a Forb Mineral Shallow Marsh and Duckweed Floating-leaved Shallow Aquatic complex	The most abundant species in the canopy were Red and Silver maple, with Red oak and American Beech. The sub-canopy was predominately comprised of Red oak, American Beech and Blue Beech and the understory contained some Black ash with Red Osier dogwood. The ground layer consisted of Sensitive fern, Swamp beggar-ticks, Royal fern and Spinulose wood fern. The above swamp community is complexed with small ponds associated with small shallow marshes which are found throughout.	This feature is north of Concession 5, between Shafley Road and Wellandport Road. The Chippawa Creek Slough Forest Wetland Complex is within. The swamp community is complexed with small ponds associated with small shallow marshes which are found throughout.	Supported three amphibian species (Green Frog, Bullfrog, Gray Treefrog). Greater than 150 individuals were observed during call counts. Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo152	0.45	CUW1-6* Black Walnut-Green Ash Mineral Cultural Woodland	Codominance in canopy cover of black walnut and green ash. This community results from, or maintained by, cultural or anthropogenic-based distubances.	This feature is a small, linear, isolated woodlot traversed by Shafley Road.	None observed during site investigation	Supports woodland interior habitat and breeding bird interior habitat.
		FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous forest	This community was dominated by white ash, sugar maple and basswood in the canopy. Grasses were the most prevalent in the ground layer.			
		FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	Bur oak white oak and maple sp. Dominated equally in this community. Other assoicates in the canopy include red oak and green ash. Gray dogwood is present in the understory.			
		FOD3-1 Dry to Fresh Poplar Deciduous Forest	Tembling aspen is the dominant vegation in the canopy, sub-canopy and understory in this community. Ground cover included goldenrod species and phragmites.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo153	25.98	CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.	Feature is traversed by Townline Dunnville Wainfleet. Surrounded by agricultural land use.	Supported one amphibian species (Gray Treefrog). One individual was observed during call counts. Supports deer congregation area. Supports snake hibernacula habitat.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.			
wo154	21.25	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.	This feature is in proximity to woodlot 154. A watercourse is located at the southern extent of the	Supported two amphibian species (Spring Peeper, Chorus Frog). Two individuals were observed	Does not support breeding bird interior habitat (200 m from edge) or woodland

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo154	21.25	FOD5-9 Dry-Fresh Sugar Maple-Red Maple Deciduous Forest	The canopy of this community consisted of Sugar maple and Red maple in roughly equal proportions, with some Red oak and White birch. The sub-canopy included Sugar maple and Red maple, with Shagbark hickory and Red oak. The understory contained Blue beech and American beech with less common occurrences of American elm and White birch.	woodlot. Some deep depressions present, which could become seasonally flooded.	during call counts. Supports a deer congregation area.	from edge) or woodland interior habitat (200 m from edge).
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this coomunity, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			
wo155	0.53	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	Feature is a small isolated woodlot, bordered by Highway 3 and Buckner Road.	Amphibian Breeding Habitat was identified adjacent to the candidate feature.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo156	6.89	FOM8-1 Fresh-Moist Poplar Mixed Forest	Trembling aspen dominated this community with some scots pine as an associate. Understory vegation included staghorn sumac and riverbank grape. Ground cover was not identifiable.	Feature is located at the intersection of Highway 3 and Townline Dunnville Wainfleet. Watercourse is located at the southern reaches of the woodlot. In proximity to woodlot 160 and 163.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.			
		FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo157	0.82	MAS2-1/FOD8-1 Cattail Mineral Meadow Marsh with Fresh-Moist Poplar Deciduous Forest	This complex community supports a poplar deciduous forest as well as a cattail dominated mineral meadow marsh. Areas for potential vernal pooling occur throughout.	Feature is north of Highway 3. It is a small isolated woodlot surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo158	0.02	CUP3-1 Red Pine Coniferous Plantation	This community included a plantation of red pine which was unmaintained, other species present included white spruce, white pine and green ash.	Feature adjacent to Highway 3. Small isolated woodlot.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo159	0.27	CUP3-3 Scotch Pine Cultural Plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.	Small, isolated woodlot, north of Highway 3.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo160	2.14	SWD4-3 White-Birch Poplar Mineral Deciduous Forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.	This feature is bordered by a watercourse to the north and in proximity to woodlot 163.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo161	0.38	FOD5-10/CUP3-3 Dry to Fresh Sugar Maple-White Birch-Poplar Deicuous Forest with a Scotch Pine Cultural Plantation inclusion	This community was dominated by Eastern cottonwood in the canopy with sugar maple as an associate. The subcanopy was dominated by sugar maple with trembling aspen and scots pine occuring regularly. Understory vegetation consisted of raspberry species and hawthorn. with goldenrod and reed canary grass in the ground layer. This community also had a Scotch Pine Cultural Plantation inclusion.	Small, isolated woodlot, south of Highway 3. Watercourse present at the southern reaches of the woodlot.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo162	1.22	FOM2-2 Dry to fresh white pine-sugar maple mixed forest	Freeman's maple is the dominant canopy cover in this community, Eastern cottonwood, sugar maple and white pine are common associates. Subacanopy species include trembling aspen and norway spruce, The understory is sparse and includes white spruce and staghorn sumac. Ground cover is dominated by goldenrod species and rivrbank grape.	Small, isolated woodlot, north of Highway 3. Surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo163	28.48	SWD4-3 White-birch Poplar Mineral deciduous forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.	This feature is traversed by Townline Dunnville Wainfleet, south of Buckner Road. The Clay Plain wetland complex is found within.	Supported six amphibian species (Spring Peeper, Chorus Frog, American Toad, Green Frog, Bullfrog, Gray Treefrog). Thirty individuals were observed during call counts. Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.			
		FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.			
		FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.			
		SWD Deciduous Swamp	Assessed from the roadside, this swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo164	0.10	CUP Cultural Plantation	A treed community, resulting from, or maintained by, cultural or anthropogenic-based distubances.	This small, linear feature is just north of Highway 3 and surrounded by agricultural land uses.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo165	1.15	MAS2-1/FOD8-1 Cattail Mineral Meadow Marsh with Fresh-Moist Poplar Deciduous Forest	This complex community supports a poplar deciduous forest as well as a cattail dominated mineral meadow marsh. Areas for potential vernal pooling occur throughout.	This small feature is just north of Highway 3 and surrounded by agricultural land uses.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo166	0.94	FOD3-1/MAM2-11* Dry-Fresh Poplar Deciduous Forest with Foxtail Mineral Meadow Marsh Inclusion	This forest community has canopy cover of aspen, maple, elm, ash and birch species. A meadow marsh inclusion dominated by foxtail grasses was located within this deciduous forest community.	This small feature is just north of Highway 3 and surrounded by agricultural land uses.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo167	0.65	CUP1-3 Black Walnut Deciduous Plantation	This plantation was dominated by mature black walnut, with rarely occurring sugar maple in the canopy. Ground cover was obstructed by residences.	This small, linear feature is just north of Highway 3 and surrounded by agricultural land uses.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo168	0.69	CUP1-3 Black Walnut Deciduous Plantation	This plantation was dominated by mature black walnut, with rarely occurring sugar maple in the canopy. Ground cover was obstructed by residences.	This small feature is just north of Highway 3 and surrounded by agricultural land uses.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo169	0.45	CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	This small feature is just south of Highway 3 and surrounded by agricultural land uses.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo170	3.79	FOD6-1 Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest Type; FOD7-1	The canopy species found in this community included sugar maple, white ash, red oak and Scots pine. Sub-canopy species present included Sugar maple, American beech, American basswood and hop hornbeam. The understory consisted of poison ivy, wild red raspberry, Virginia creeper and a currant/gooseberry species. The ground layer contained species such as Garlic mustard, wood nettle, aster species, goldenrod species, red raspberry, sedge species and spotted touch-me-not.	This linear feature is surrounded by active agriculture and located adjacent to a municipal road and agricultural buildings.	Supported two amphibian species (Bullfrog and Green Frog). Two individuals were observed during call counts.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo171	0.22	FOD8-3* Fresh to moist Eastern Cottonwood Deciduous Forest	This small community is dominated by Eastern cottonwood in the canopy, with trembling aspen and white elm associates. The sub-canopy was dominated by staghorn sumac, riverbank grape also occurred. The ground layer included species of goldenrods and burdock.	This feature is a small, isolated woodlot south of Highway 3. It is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo172	4.85	FOD4-2 Dry-Fresh White Ash Deciduous Forest	This community was dominated by white ash in the canopy and subcanopy, other associates included red oak, white oak and trembling aspen. Understory vegation included riverbank grape, the ground layer was not visible during the survey.	This feature is north of Jenny Jump Road and west of Hutchinson Road. A watercourse borders the eastern extent of the woodlot. Feature is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat, Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo173	2.54	CUP3-3 Scotch Pine Cultural Plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.	Feature is traversed by Townline Dunnville Wainfleet. Surrounded by agricultural land use.	None observed during site investigation	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo174	0.12	CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	Small feature, just south of Highway 3.	None observed during site investigation	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo175	0.60	CUW1-3* Black Locust Mineral Cultural Woodland	This community is quite open with Black locust dominating in the canopy. Ground cover includes species of grasses and teasel.	Surrounded by active agriculture and located adjacent to a drain on the southern portion of the property. The deciduous forest extends outside of the zone of investigation with portions extending into the East of Dunnville Woodlots.	Supports amphibian breeding habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo176	5.56	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Dominated by Sugar Maple and American beech with other hardwood species in the canopy. The understory vegetation included Staghorn sumac and riverbank grape.	Feature is surrounded by agricultural land use. It is north of Booker Road and west of Townline Dunnville Wainfleet.	Supported three amphibian species (Spring Peeper, Green Frog, Gray Treefrog). Fifteen individuals were observed during call counts. Supports deer	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		congregation area.	
wo177	11.18	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	Swamp thicket traverses through woodlot. Adjacent to Beaver Creek Wetland Complex. No standing water was observed.	Supported three amphibian species (Green Frog, Bullfrog, Gray Treefrog). Ten individuals were observed during call counts. Supports deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo178	126.16	FOD5-2/SWD2-2 Dry-Fresh Sugar Maple-Beech Deciduous forest with a Green Ash Mineral Deciduous Swamp complex	The canopy of this community is comprised predominately of Sugar maple, American Beech, with lesser components of Red oak and American basswood, while both the sub-canopy and understory primarily consisted of American beech, Sugar maple and Hop hornbeam. The ground cover consisted of Sedge species, Avens species and Christmas fern. A complex of Green Ash Mineral Deciduous Swamp is associated with the above community due to the presence of low-lying areas containing hydrophilic species and some pools of water.	Feature is west of Hutchison Road and is traversed by Jenny Jump Road.	Supported one amphibian species (Spring Peeper). Twenty three individuals were observed during call counts. Supports a deer congregation area. Supported woodland raptor habitat	Provides 17.4 ha of woodland interior habitat and breeding bird interior habitat. Woodland Raptor nesting habitat and Woodland area sensitive bird breeding habitat.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo179	31.34	CUP3 Coniferous Plantation	This plantation is dominated by various mixes of coniferous plantation species in either variable dominances or species identification was not possible.	Feature is traversed by Booker Road. Land use surrounding the feature is agricultural.	Supports a deer congregation area	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo180	326.73	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.	Feature is traversed by Jenny Jump Road, Crown Road and a watercourse. It is in proximity to several other woodlots.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Provides 6 ha of woodland interior habitat and breeding bird interior habitat.
		FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.			
wo181	0.10	FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.	Small woodlot adjacent to woodlot 183.	Supports woodland breeding amphibian habitat	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo182	0.95	SWD4-3 White-birch Poplar Mineral deciduous forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.	Small woodlot directly abuts feature woodlot 183. Bordered by Hutchinson Road to the east.	None observed during site investigation	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.			
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this coomunity, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo183	116.99	FOD7 Fresh – Moist Lowland Deciduous Forest	Canopy species consisted of swamp maple, paper birch and eastern cottonwood, with swamp maple, green ash, black cherry, and paper birch in the sub canopy. Spicebush and gray dogwood formed the larger part of the understory, while green ash, enchanter's nightshade, and Virginia creeper made up the ground vegetation.	Feature is located between Bird Road and Hutchinson Road. Evidence of recreational use including a trailer, shed, chairs and mown areas and trails throughout. An open pond is located within.	Supported five amphibian species (Spring Peeper, Chorus Frog, American Toad, Green Frog, Gray Treefrog). Greater than 100 individuals were observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
		FOD3-1 Dry to Fresh Poplar Deciduous Forest	Tembling aspen is the dominant vegation in the canopy, sub-canopy and understory in this community. Ground cover included goldenrod species and phragmites.			
		SWD3-2 Silver Maple Mineral Deciduous Swamp	The canopy in this community primarily consisted of Silver maple, with Green ash, Red oak and Red maple. The sub-canopy also contained Silver maple, with Green ash and Red maple, Bur Oak and Blue Beech. The understory included Buttonbush, Spicebush, winterberry, Highbush Blueberry with components of Silver maple and Green ash, while the ground layer contained sensitive fern, with Tall white aster, reed canry grass, sedges.			
		MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.			
wo184	46.93	SWD 2-3* Ash-Poplar Deciduous Mineral Swamp	This community was dominated by green ash in the canopy with eastern cottonwood and trembling aspen also present. The understory consisted of young green ash, wild red raspberry, narrow-leaved meadowsweet and gray dogwood. Virginia creeper was the dominant ground cover within the community with sumac and jewelweed also present.	Feature 184 is north of Concession 1, west of Sideroad 30. It is bound by agricultural land use but in proximity to a large wooded area and East Wetland Complex.	Supported three amphibian species (Spring Peeper, Green Frog, American Toad). Sixty five individuals were observed during call counts. Supports a deer congregation area. Candidate significant habitat for Landbird Migratory Stopover. Not identified as significant as field investigations showed it did not meet the criteria.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Connected to the Moulton East Wetland Complex by a drainage feature extending westward on the southern portion of the feature.
wo185	12.57	FOD6 Fresh-Moist Sugar Maple Deciduous Forest	This community is dominated by sugar maple in the canopy and the understory. Occasional Black walnut and green ash are also present.	Feature 185 is directly west of Bird Road, surrounded by agricultural land use.	Supports woodland breeding amphibian habitat Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		FOD/SWD Deciduous Forest with Deciduous Swamp Inclusion	This community was assessed from the roadside to the 120m boundary. Community is predominatley deciduous tree cover with evidence of wet pockets throughout.			
wo186	1.56	CUW1-10* Ash Cultural Woodland	The canopy was made up primarily of white ash, bitternut hickory, and american basswood. American ash, hawthorn species, and black walnut formed the dense sub canopy and understory layers. The ground vegetation consisted of goldenrod, knapweed and grasses.	Feature 186 is bordered by Bird Road to the west and a watercourse to the east. It is in proximity to woodlots 185 and 183, however it is surrounded by agricultural land use.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo187	0.48	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.	Feature 187 is located south of Concession 1, west of Burke Road. This small feature is surrounded by agricultural land use.	Supports woodland breeding amphibian habitat	Small isolated woodlot. Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo188	0.67	CUW1-6*Black Walnut-Green Ash Mineral Cultural Woodland	This community included a canopy cover of black walnut and green ash, with gray dogwood and riverbank grape occupying the understory. Ground vegetation includes cattails, goldenrods and wild teasel.	This small feature is located north of Canal Road, bordered by a watercourse to the east and south.	None observed during site investigation	Small isolated woodlot. Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo189	0.39	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	Small woodlot directly abuts feature woodlot 190. Bordered by Bird Road to the east.	Supports woodland breeding amphibian habitat Supports a deer congregation area Candidate for significant habitat for Landbird Migratory Stopover. Not identified as significant as field investigations showed it did not meet the criteria.	Does not provide woodland interior habitat (200 m from edge) or breeding bird interior habitat (200 m from edge). Does not provide migratory bird habitat.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo190	25.57	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	This feature is bordered by Bird Road to the east, and Canal Bank Road to the south. It is surrounded by agricultural use.	Supports woodland breeding amphibian habitat Supports a deer congregation area Candidate for significant habitat for Landbird Migratory Stopover. Not identified as significant as field investigations showed it did not meet the criteria.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Does not provide migratory bird habitat.
		FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.			
wo191	22.99	SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	Feature 191 is located south of Concession 1 and east of Hutchinson Road. It is in close proximity to another woodland feature to the north. Located adjacent to Moulton East Wetland Complex.	Supports one amphibian species (American Toad). One individual was observed during call counts. Supports a deer congregation area.	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge). Adjacent to Moulton East Wetland Complex.
		SWD2-2 Green Ash Mineral Deciduous Swamp	Green ash was the dominant canopy cover in this community, along with silver maple and red oak associates. Ground cover was not determined due to visibility.	Feature is location west of		Small isolated woodlot.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo192	1.14	CUP3-3 Scotch Pine Cultural Plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.	Hutchinson Road. Watercourse borders northern extent of small woodlot. Standing water present to the south.	None observed during site investigation	Does not provide woodland interior habitat (200 m from the edge) or breeding bird interior habitat (200 m from edge).
wo193	0.75	FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.	Feature 193 is a small woodlot that abuts significant woodlot 194. A watercourse is bordering the northern extent.	Supported five amphibian species (Spring Peeper, Chorus Frog, American Toad, Green Frog, Bullfrog, Gray Treefrog). Greater than 3,000 individuals were observed during call counts. Supports significant habitat for migratory birds.	Small woodlot abutting significant woodlot 194. Supports significant habitat for a migratory landbird stopover area and amphibian breeding. Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		SWD5-1 Black Ash Organic Deciduous Swamp	The canopy in this community consisted of Black ash, Red maple and Yellow birch, with less common occurrances of Freeman's maple, Crack willow and White elm. The understory contained Spicebush and occasionally Crack willow and willow speices. The ground layer species included Sensitive fern, Moss species, Tall white aster and Spinulose wood fern.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo194	221.91	FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	The canopy in this community was dominated by Green ash, with Red maple and sparse White elm and Trembling aspen. Green ash and White elm were the most abundant species in the sub-canopy, with infrequent occurrences of Red maple and Trembling aspen. The understory included Green ash, White elm, Staghorn sumac and Nannyberry, while the ground layer was largely Sensitive fern with Canada and Tall goldenrods and Raspberry species. An inclusion of a Cattail Mineral Shallow Marsh was identified within the above community.	Feature 194 is located south of Canal Bank Road, east of Bird Road. Small pools of surface water throughout the feature. Feature contains the Moulton Wetland West Complex. Disturbance observed (shed).	Supported five amphibian species (Spring Peeper, Chorus Frog, American Toad, Green Frog, Bullfrog, Gray Treefrog). Greater than 3,000 individuals were observed during call counts. Supports a deer congregation area. Supported woodland raptor habitat (list species). Supported marsh breeding	Provides 47.7 ha of woodland interior habitat and breeding bird interior habitat. Significant habitat for migratory birds.
		SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy cover was dominated by green ash, with red maple and American elm associates. Shallow pools of water were observed throughout. Raspberry was found commonly within the understory. A large variety of herbaceous species were observed within the ground layer, including goldenrods, grasses and sedge species.			
		FOD7-6* Fresh-Moist Manitoba Maple – Ash Lowland Deciduous Forest	The canopy was made up of young to mid-age Manitoba maple and ash, with an understory consisting of Manitoba maple, ash and grape vine. The ground layer was dominated by grape vine and panicled aster. The community was confined to the banks of a stream running between residential and agricultural land uses, and some evidence of past logging was apparent.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
		SWD3-2 Silver Maple Mineral Deciduous Swamp	The canopy in this community primarily consisted of Silver maple, with Green ash, Red oak and Red maple. The sub-canopy also contained Silver maple, with Green ash and Red maple, Bur Oak and Blue Beech. The understory included Buttonbush, Spicebush, winterberry, Highbush Blueberry with components of Silver maple and Green ash, while the ground layer contained sensitive fern, with Tall white aster, reed canry grass, sedges.		bird habitat (list species) Provides significant habitat for migratory birds.	
		CUW1-3*/MAM2-6 Freeman Maple Cultural Woodland with a Broad-leaved Sedge Mineral Meadow Marsh inclusion	The canopy of this community consisted of Cottonwood species, with the sub-canopy containing both Cottonwood and Freeman's maple. The understory included Freeman's maple as well as Canada goldenrod, Tall white aster, Common boneset. Evidence of past clearing was observed and this community appears to be the result of regeneration. A broad-leaved sedge meadow marsh occurred as an inclusion within the woodland community. The cultural woodland contained a clay-loam soil with an organics layer of 22.8cm in depth and a moisture regime of 4-5. Depth to bedrock was >120cm.			
		CUT1-7*Tartarian Honeysuckle Cultural Thicket	Dominated by Tartarian honeysuckle in the understory layer, with some gray dogwood. The ground layer is dominated by Canada goldenrod, grasses and riverbank grape.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo195	29.14	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species.	This feature is located north of Rymer Road, west of Dickhout Road. It is traversed by a watercourse, and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		CUT1-1/CUM1-1 Sumac Cultural Thicket with Dry-Moist Old Field Meadow Inclusion	A shrub community dominated by staghorn sumac, surrounded by a cultural meadow, supported by various species of grasses, goldenrods and asters. This complex community is a result from, or maintained by, cultural or anthropogenic-based distubances.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo196	9.18	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	This feature is north of Rymer Road and west of Dickhout Road. This feature is surrounded by agricultural land use with a watercourse to the north.	Supported three amphibian species (Spring Peeper, Chorus Frog, Gray Treefrog). Approximately 88 individuals were observed during call counts. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 198	10.96	FOD9-2/MAM2-2 Fresh-Moist Oak-Maple Deciduous Forest with Cattail Mineral Meadow Marsh Inclusion	This community had a canopy consisting of Red oak, Red maple and Green ash, with few Black cherry and Willow species. The sub-canopy also contained Red oak and Red maple with sparse occurrence of Black cherry and Green ash. The understory included mainly spicebush, with American beech and Currant species, while the ground layer was comprised of Calico aster, Canada goldenrod, Reed-canary grass and Riverbank grape. A Cattail Mineral Meadow Marsh inclusion was identified within the above community.	Woodland feature 198 is located directly adjacent to Wellandport Road. This feature is surrounded by agricultural land use and within close proximity to a watercourse feature south of the woodland.	Supports woodland breeding amphibian habitat. Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 199	62.08	CUM1-1 Dry-Moist Old Field Meadow	This community consisted of several forbs and grasses in varying composition and dominance including Goldenrod species, ox-ey daisy, wild teasel, wild carrot, tufted vetch, reed canary grass, Awnless brome, Scarlet strawberry, Knapweed, Kentucky bluegrass	This large woodland feature is located east of Wellandport Road. A small watercourse feature to the north separates this feature from woodland feature 198. The woodland is predominantly surrounded by agricultural land use.	Supports a deer congregation area	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
		FOD9-1	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.			
wo 200	0.12	CUP1-3 Black Walnut Deciduous Plantation	This plantation was dominated by mature black walnut, with rarely occurring sugar maple in the canopy. Ground cover was obstructed by residences.	This small woodland feature is located on the northeast corner of Wellandport Road and Concession 5. The feature is surrounded by residential and agricultural land use.	None observed during site investigation	Does not provide woodland interior habitat (200m from edge) or breeding bird interior habitat (200m from edge). Small isolated woodland feature.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 201	0.50	CUP3 Coniferous Plantation	The dominant canopy species was young to mid-age spruce trees with a much smaller component of young sugar maple trees scattered throughout. Since it was a young community, canopy cover was more open than is typically seen in coniferous plantations. Ground vegetation was profuse and was dominated by short grasses with occasional occurrences of panicled asters and new-england asters throughout.	Feature 201 is located on the southeast corner of Wellandport Road and Concession 5. The feature is surrounded by residential and agricultural land use.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge). Small isolated woodland feature.
wo 202	0.81	SWD Deciduous Swamp	Assessed from the roadside, this swamp community was dominated by deciduous tree species. Species could not be confirmed due to restricted property access	Feature 202 is located west of Wellandport Road and surrounded by agricultural land use.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 203	0.46	CUW1-4*Green Ash Mineral Cultural Woodland	Green ash dominates this community in the canopy and the understory with less than 60% cover. Riverbank grape, reed canary grass and goldenrod are present in the ground layer.	Feature 203 is located east of Wellandport Road and transversed by a watercourse to the south.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 204	0.67	FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.	Feature 204 is located east of Wellandport Road and surrounded by agricultural land use.	Supports amphibian breeding habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 205	0.48	FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.	Feature 205 is located east of Wellandport Road and surrounded by agricultural land use. A small watercourse feature transverses north of the woodland.	Supports amphibian breeding habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge). Small isolated woodland feature.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 206	3.08	FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite	Sugar maple, red oak, large-tooth aspen and hemlock comprised the canopy species. The sub-canopy contained primarily sugar maple, hop hornbeam and American beech. The understory consisted of sugar maple and american beech saplings, with less frequent occurrences of wild red raspberry and Millspaugh's blackberry, while the ground vegetation contained species such as sugar maple, panicled aster, avens, Large-leaved aster, enchanter's nightshade, jack-in-the-pulpit and thimble berry.	Feature 206 is located north of Concession 5 and transversed by a watercourse to the north. The woodland is surrounded by residential and agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 207	0.20	CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.	This small woodland feature is located east of Dunnville Wainfleet Road and approximately 50m from a drainage feature to the north. The woodland is surrounded by agricultural land use.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 208	23.60	CUM1-1 Dry-Moist Old Field Meadow	This community consisted of several forbs and grasses in varying composition and dominance including Goldenrod species, ox-ey daisy, wild teasel, wild carrot, tufted vetch, reed canary grass, Awnless brome, Scarlet strawberry, Knapweed, Kentucky bluegrass	This large woodland feature is located east of Townline Dunnville Wainfleet and within close proximity to woodland features 208 and 215.	Supports woodland breeding amphibian habitat.	Does not support breeding bird interior habitat (200 m from edge) or woodland
		CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.			

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 208	25.80	CUP3-3 Scotch Pine Cultural Plantation	This plantation was dominated by scots pine, white pine and red oak occur sporadically within the community. Sub-canopy and understory vegetation includes staghorn sumac, trembling aspen and riverbank grape. The ground layer included goldenrod sp and wild asparagus.	This woodland is surrounded by agricultural and residential land use. A watercourse transverses through the southern portion of the feature.	Supports a deer congregation area	from edge) or woodland interior habitat (200 m from edge).
		FOD Deciduous Forest	This community could not be thoroughly surveyed due to the lack of a suitable vantage point along the road. Canopy species observed included Norway maple, sugar maple, and red oak. The community exists within a low valley slope with a creek at the bottom.			
wo 209	1.74	FOD6 Fresh – Moist Sugar Maple Deciduous Forest	The canopy consisted of sugar maple, red oak, and shagbark hickory. Occasional black walnut and green ash were also present. Ground vegetation observed at the edge of the forest included ox-eye daisies, goldenrod, and bird's foot trefoil. These species are not indicative of the interior of the community.	Feature 209 is located on the northwest corner of Canal Bank Road and Dunnville Wainfleet Road. The woodland is surrounded by agricultural land use.	Supports amphibian breeding habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 210	0.38	CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.	This small woodland feature is located north of Hutchinson Road and surrounded by agricultural and residential land use.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge). Small isolated woodland feature.

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 211	0.87	FOD6 Fresh – Moist Sugar Maple Deciduous Forest	The canopy consisted of sugar maple, red oak, and shagbark hickory. Occasional black walnut and green ash were also present. Ground vegetation observed at the edge of the forest included ox-eye daisies, goldenrod, and bird's foot trefoil. These species are not indicative of the interior of the community.	This small woodland feature is located south of Hutchinson Road/Regional Road 65 and surrounded by agricultural and residential land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 212	75.33	SWD3 - Maple Mineral Swamp	This community is dominated by a variable mix of red oak, bur oak and silver maple. Sugar maple is also present as an associate. Understory vegetation includes gray dogwood and virginia creeper.	This large woodland feature is located south of Feeder Canal Road. A small portion of the feature extends into the zone of investigation. The woodland is predominantly surrounded by agricultural land use. A watercourse transverses through the northern portion of the feature.	Suuports a deer congregation area.	Provides 6.24 woodland interior breeding bird habitat (200m from edge).
wo 213	4.51	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	Feature 213 is located west of Turbine 65 and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area	Does not provide woodland interior habitat (100m from edge) or breeding bird interior habitat (200m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 214	3.12	FOD6 Fresh – Moist Sugar Maple Deciduous Forest	The canopy consisted of sugar maple, red oak, and shagbark hickory. Occasional black walnut and green ash were also present. Ground vegetation observed at the edge of the forest included ox-eye daisies, goldenrod, and bird's foot trefoil. These species are not indicative of the interior of the community.	Feature 214 is located south of Booker Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 215	0.58	CUW1 Mineral Cultural Woodland	The average height of trees in this community was 6 to 8 m and the most abundant species were swamp maple, green ash and trembling aspen. There was a dense understory of gray dogwood, swamp maple, and narrow-leaved meadowsweet, and a ground layer of Kentucky bluegrass, creeping cinquefoil, scarlet strawberry, and goldenrod.	Feature 215 is located east of Dunnville Wainfleet Road and surrounded by residential and agricultural land use.	None observed during site investigation	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 216	2.22	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	This small woodland is located on the southeast corner of Townline Castor Gainsborough and Elcho Road. The feature is surrounded by agricultural land to the south and east.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 217	31.01	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	This large woodland feature is located south of Elcho Road and west of Turbines 09 and 51. The woodland is surrounded by agricultural land use. A watercourse transverses south of the feature. Water of 15cm in depth was observed at a potential seep where Water-cress was present. The soil in the Oak-Sugar maple deciduous forest were a sandy clay with a moisture regime of 6 and mottles at 25cm. Located within the Port Davidson Slough Forest Wetland Complex. Pooled water of 5-20cm in depth was found throughout the community. Adjacent habitat includes deciduous woodland, marsh and swamp located within the Port Davidson Slough Forest Wetland Complex.	Supports three amphibian species (Spring Peeper, Chorus Frog and Bullfrog). Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 218	8.49	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	Feature 218 is located north of Elcho Road and surrounded by agricultural land use.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge). Supports a rare vegetation within the woodland feature: SWT2-4/MAS2-1 Buttonbush Mineral Thicket Swamp/Cattail Mineral Shallow Marsh.
wo 219	1.32	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	Feature 219 is located west of Krick Road, north of Turbine 07. This woodland is surrounded by agricultural land use. A watercourse transverses south of the woodland.	Supports amphibian breeding habitat	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 220	3.04	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	Feature 220 is located south of Vaughan Road. The woodland is surrounded by agricultural and residential land use, and a watercourse which forks south of the feature and transverses along the east and west side.	None observerd from roadside survey.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 221	36.25	CUP3 Coniferous Plantation	The dominant canopy species was young to mid-age spruce trees with a much smaller component of young sugar maple trees scattered throughout. Since it was a young community, canopy cover was more open than is typically seen in coniferous plantations. Ground vegetation was profuse and was dominated by short grasses with occasional occurrences of panicled asters and new-england asters throughout.	This large woodland feature is located south of Elcho Road and east of Krick Road. The woodland is surrounded by agricultural land use and a watercourse transverses along the north side of the feature.	Supports woodland breeding amphibian habitat. Supports a deer congregation area.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.7 Site Investigation Results - Woodlands

Woodland No.	Feature Size (ha)	ELC Community Type (s)	Description	Attributes, Characteristics and Functions	Wildlife Functions	Habitat Features
wo 222	0.27	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	Feature 222 is a small woodland located west of Krick Road and approximately 100m north of a drainage feature. The woodland is surrounded by agricultural land use.	Supports amphibian breeding habitat.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).
wo 223	2.20	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	Feature 223 located directly adjacent to a watercourse and Krick Road. The woodland is surrounded by agricultural land use to the west.	Supports amphibian breeding habitat.	Does not support breeding bird interior habitat (200 m from edge) or woodland interior habitat (200 m from edge).

Table 4.8 Site Investigation Results - Rare Vegetation Communities

Feature No.	Description	Vegetation Type	Provincial Rank
rv1	This was a small woodlot surrounding a residence. The dominant canopy species were sugar maple, red oak, and shagbark hickory, and there was a moderately thick sub-canopy consisting of sugar maple, hop hornbeam, American beech, and blue beech. There was no evident understory shrub layer. The ground vegetation consisted primarily of sugar maple, blackberry species, and large-leaved aster. Soils were deep, clay dominated, and with mottles at approximately 25cm, giving it a moisture regime of 6 or very moist. There was evidence of past logging activity. The community contained an inclusion of shallow marsh dominated by a barnyard grass species. There was also a complex of buttonbush mineral thicket swamp, confined mostly to the southeastern half of the community.	FOD6-5/MAS2-10*/SWT2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest With an inclusion of Barnyard Grass Mineral Shallow Marsh and a complex of Buttonbush Mineral Swamp Thicket	S3
rv2	This was a small community centered within an agricultural field. Canopy height did not exceed 1.5m and exhibited heavy dieback but with vigorous regeneration within the ground cover. No other woody species were observed. Herbaceous species consisted largely of pale smartweed, with fewer occurrences of blue vervain, reed-canary grass, and sedge/rush species. Surface water was present with a depth of approximately 10cm.	SWT2-4 Buttonbush Mineral Thicket Swamp	S3
rv3	This community occupies approximately the southwestern third of the property. The most abundant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The moderately thick understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. Soils were variable through the community, with a clay dominated soil in some areas and a sandier, siltier component in others. Mottles were present within 17cm and 25 cm of the surface respectively for each type. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools (5 -10cm) with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	S3
rv4	This community contained sparse Red maple in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Fern species, Sedge species, Grass species and Duckweed. Water was present throughout this community at a depth from 5-40cm.	SWT2-4 Buttonbush Mineral Thicket Swamp	S3
rv6	This small community is dominated by a mix of buttonbush and Cattails, occuring in similar proportions. Bur oak occurs rarely in the canopy and ground vegetation included abundant lakebank sedge. Water was present throughout the community.	SWT2-4/MAS2-1 Buttonbush Mineral Thicket Swamp/Cattail Mineral Shallow Marsh	S3
rv7	This small community is dominated by equal proportions of buttonbush and reed canary grass. Likely a remnant of a larger community, it occurs within a wide Hedgerow community along an agricultural field. Willow ocassionally occurs in the canopy.	MAM2-2/SWT2-4 Reed Canary Grass Meadow Marsh/ Buttonbush Mineral Swamp Thicket	S3

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah1	wo36	10.08	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	Some pockets of deep, saturated organic soil were found throughout. Contained with Upper Sixteen Mile Creek Wetland Complex. Adjacent habitat includes deciduous woodland.	None observed within candidate habitat. One species observed outside of the candidate habitat in June 2012: Gray Treefrog.
ah2	wo36, wo43, wo44	25.67	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	The canopy consisted of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated the ground layer. There was a swamp maple swamp complex within the community.	Tractor paths were found within. Located adjacent to the Upper Sixteen Mile Creek Wetland Complex. Some pockets of deep, saturated organic soil were found throughout. Adjacent habitat includes deciduous woodland.	Two species were observed in April 2012: Spring Peeper, 10 individuals; and Chorus Frog, 7 individuals. Both species were also observed outside of the candidate habitat. None observed in May or June 2012.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah3	wo43, wo44	2.15	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	The community contained occasional pockets of vernal pool habitat, often with a buttonbush thicket swamp component. Depths of surface water at the time of the survey varied from 3- to 35 cm. Contained with Upper Sixteen Mile Creek Wetland Complex.	One species observed in April 2012: Spring Peeper, 20 individuals. One species observed in May 2012: Gray Treefrog. None observed in June 2012.
ah5	wo51	1.04	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	Adjacent to a muncipal road and surrounded by active agriculture.	None observed in April 2012. One species observed in May 2012: Gray Treefrog, 3 individuals. Grey Treefrog was also observed outside of the candidate habitat. None observed within the candidate habitat in June 2012; however, Greenfrog was observed outside the candidate habitat.
ah6	wo52	41.29	FOD9/SWD Fresh – Moist Oak – Maple – Hickory Deciduous Forest with a Deciduous Swamp Complex	This community was assessed from the edge, but it appeared to be a complex of FOD and SWD, with the swamp containing swamp maple and oak species. Canopy species in the forest consisted of sugar maple, shagbark hickory, swamp maple, and swamp oak. The understory was primarily made up of gray dogwood with lower abundances of choke cherry and nannyberry. Goldenrod, scarlet strawberry and garlic mustard were the most abundant species in the ground layer.	Adjacent to a muncipal road and the Silverdale Wetland Complex.	Not surveyed in April 2012. One species observed in May 2012: American Toad, 3 individuals. Gray Treefrog observed outside of candidate habitat in May 2012. None observed in June 2012.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah9	wo54, wo56, wo59, wo66, wo68, wo83	95.95	SWT2-6 Meadowsweet Mineral Thicket Swamp	Occasional tree species occurred, including ash, swamp white oak and willow. The vegetation was dominated by narrow-leaved meadowsweet with silky dogwood, red-panicled dogwood and red raspberry, while the ground layer consisted of wool-grass, reed-canary grass, broad-leaved cattail, beggar-ticks rush and sedge species.	One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics. Contained within the St. Anne's Slough Forest Wetland Complex. Contained within the St.	One species was observed in April 2012: Spring Peeper (chorus), and was also observed outside of candidate habitat. Two species were observed in May 2012: Green Frog and Gray Treefrog. Gray Treefrog was also observed outside of the candidate habitat. None observed in June
			CUT1-7* Red Osier Dogwood Cultural Thicket	The sub-canopy layer occasionally contained species such as Spicebush, while the understory was comprised of Canada goldenrod, Tall white aster, Spicebush and Red osier dogwood. Species occurring less frequently included staghorn sumac, American elm, Bitternut Hickory and Red Raspberry. Tall white aster was also a ground layer component.		
			FOD1-1 Dry-Fresh Red Oak Deciduous Forest Type	This community contained red oak, white ash and American beech located within the canopy cover. Ground cover was dominated by large-leaved aster.		
			SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		
			MAS2-9 Forb mineral shallow marsh	Dominated by various forb species including canada goldenrod, tufted vetch, wild teasel, white panicled aster, a lemna sp., grasses, reed canary grass, sedge species, blue flag iris, and water plantain.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	Anne's Slough Forest Wetland Complex.	2012.
			SWD1-1 Swamp White Oak Deciduous Swamp	The canopy was dominated by swamp white oak, with less common occurrences of red maple, red oak and green ash. The understory consisted of species such as narrow-leaved meadowsweet and red-panicled dogwood. Reed-canary grass, sensitive fern, blue flag iris and wild red raspberry were species occurring in the ground layer.		
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		
ah12	wo80	0.19	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	Adjacent land use includes active agriculture. Contained within Beaver Creek Wetland Complex. Adjacent communities include deciduous woodland and agriculture.	No species observed in April or June 2012. One species were observed in May 2012: Green Frog, 1 individual. This species was also observed outside of the candidate habitat. None observed within the candidate habitat in June 2012; however Northern Leopard Frog was observed outside of the candidate habitat.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah13	wo80	0.33	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	This community was a small wet meadow marsh in a slight depression surrounded by agricultural fields and associated with a drainage ditch. The ditch and part of the surrounding meadow contained 5 to 10cm of water.	None observed within candidate habitat; however, two species were observed outside of the candidate habitat in April 2012: Spring Peeper and Chorus Frog. None observed in May or June 2012.
ah14	wo79	1.02	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	The soils were clay with mottles and the water table present at 30cm. Adjacent land use includes agriculture. This community followed a drainage feature but did not contain any water at the time of the survey. Located adjacent to the Silverdale Wetland Complex.	No calls observed.
			FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	The canopy consisted of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated the ground layer. There was a swamp maple swamp complex within the community.	No surface water was present, although portions of this community occurring on	Not surveyed in April 2012. None

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah15	wo74	35.76	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	community occurring on adjacent lands (no access) appear to have the potential for seasonal flooding.	Not surveyed in April 2012. None observed in May or June 2012.
ah17	wo85, wo89, wo92	10.35	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.	No surface water was present, although portions of this community occurring on adjacent lands (no access) appear to have the potential for seasonal flooding.	None observed in April or June 2012. Ttwo species were observed within and outside of the candidate habitat in May 2012: Green frog and Gray Tree frog .
			SWT2-6 Meadowsweet Mineral Thicket Swamp	Occasional tree species occurred, including ash, swamp white oak and willow. The vegetation was dominated by narrow-leaved meadowsweet with silky dogwood, red-panicled dogwood and red raspberry, while the ground layer consisted of wool-grass, reed-canary grass, broad-leaved cattail, beggar-ticks rush and sedge species.		
ah20	wo88, wo91	0.11	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	Surrounded by agricultural field and located adjacent to St. Annes Slough Forest Wetland Complex.	One species observed in April 2012: Chorus Frog, 1 individual. Spring Peeper and Chorus Frog observed outside of candidate habitat. None observed within candidate habitat in May or June 2012. Green Frog observed outside of candidate habitat in May 2012.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah21	wo88, wo91	19.75	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.	Surrounded by agricultural field and located within St. Annes Slough Forest Wetland Complex.	Two species observed in April 2012: Spring Peeper, 2 individuals; and Chorus Frog, 1 individual. One species observed in May 2012: Green Frog, 3 individuals. Bullfrog and Woodfrog were observed outside of the candidate habitat. None observed in June 2012.
			SWT3-4 Buttonbush Organic Thicket Swamp	This community had a canopy composed mainly of eastern buttonbush and winterberry. The sub-canopy was composed of narrow-leaved meadowsweet, while sensitive fern was the sole species found in the understory.		
			SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah22	wo88, wo91	48.44	FOD5-4 Dry-Fresh Sugar Maple-Ironwood Deciduous Forest	The canopy in this forest is composed of sugar maple, red oak, bur oak and shagbark hickory. The sub-canopy is dominated by ironwood with very few white elm occuring close to feature edge. Understory vegetation is comprised of white ash and blue beech with rarely witchhazel. the ground layer was sparse, consisting of mainly grasses and young trees. Community likely disturbed by grazing in the past.	Surrounded by agricultural field and located within St. Annes Slough Forest Wetland Complex.	Two species observed in April 2012: Spring Peeper, 2 individuals; and Chorus Frog, 1 individual. None observed within candidate habitat in May or June 2012. Gray Treefrog observered outside of candidate habitat in June 2012.
			MAM2-6 Broad-leaved sedge Mineral meadow-marsh	This community is dominated by Lakebank sedge in the ground layer, with associates of cattail and Reed canary grass. Understory species were ocassional and included gray dogwood and narrow-leaved meadowsweet.		
			SWT2-4 Buttonbush Mineral Thicket Swamp	This community occasionally contained sparse Red maple and ash species in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Highbush Blueberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Beggar-ticks, Fern species, Sedge species, Grass species and Duckweed.		
			SWT2-6 Meadowsweet Mineral Thicket Swamp	Occasional tree species occurred, including ash, swamp white oak and willow. The vegetation was dominated by narrow-leaved meadowsweet with silky dogwood, red-panicled dogwood and red raspberry, while the ground layer consisted of wool-grass, reed-canary grass, broad-leaved cattail, beggar-ticks rush and sedge species.		
ah27	wo98	12.87	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	This community was assessed from the edge due to lack of property access. The most abundant canopy species in this community were shagbark hickory, swamp maple, red oak, and sugar maple. The understory consisted primarily of wild red raspberry, blue beech and hawthorn. A strawberry species was the most abundant ground vegetation species visible, followed by poison ivy and mayapple, and there were fewer occurrences of wood nettle and sedges.	Located within the Silverdale Wetland Complex.	None observed in April and May 2012. One species observed in June 2012: Northern Leopard Frog, 4 individuals; also observed outside of the station.
			SWD2-2 Green Ash Mineral Deciduous Swamp			

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah28	wo99	29.82	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.	Contained within the Upper Beaver Creek Wetland Complex. At the time of the survey there were pools of surface water of up to about 2ft deep covering approximately 70% of the land area within the SWD.	Two species observed in April 2012: Spring Peeper, 10 individuals; and Chorus Frog, 3 individuals. Spring Peeper also observed outside of candidate habitat. None observed in May or June 2012.
			FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.		
			FOD9-2/SWD1-1/SWT2-2 Fresh-Moist Oak – Maple Deciduous Forest With complexes of Swamp White Oak Deciduous Swamp and Buttonbush Mineral Thicket Swamp	The dominant canopy species were red maple, red oak and white oak, followed by smaller components of sugar maple, shagbark hickory, and green ash. Blue beech and red maple dominated the sub-canopy and understory. Other frequently observed understory species were raspberries and viburnums. The ground layer was dominated by rough goldenrod, large-leaved aster, and sedges.	The moisture regime was variable throughout the community but fell between 4 and 6 due to the location of the mottles in the soil profile. In some areas the soils were clay dominated and had a moisture regime of 6, in others there was a	Two species observed in April 2012: Spring Peeper (chorus)

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah29	wo74, wo86, wo97	78.22	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	higher sand content and mottles at 40cm. There was evidence of logging and recreational activities taking place within the community and its complex. Contained within the Highway 20 and 24 Wetland Complex. Water was present within the ditch, ranging from 5 to 20cm deep. Adjacent land use includes active agriculture and a railine.	2012: Spring Peeper (chorus), and Chorus Frog (chorus) One species observed outside of the station in May 2012: Spring Peeper. One species observed in June 2012: Green Frog, 2 individuals.
			SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		
ah30	wo100, wo101, wo102	17.18	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.	Contained within the Beaver Creek Wetland Complex. Adjancent land use includes active agriculture.	One species was observed in April 2012: Spring Peeper, 1 individual. One species observed in May 2012: Gray Treefrog, 4 individuals; also observed outside of candidate habitat. None observed in June 2012.
			FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	The canopy consisted of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated the ground layer. There was a swamp maple swamp complex within the community.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			SWT2-4 Buttonbush Mineral Thicket Swamp	This community occasionally contained sparse Red maple and ash species in the canopy layer, while the understory consisted of Eastern buttonbush, Winterberry, Highbush Blueberry, Speckled alder and Narrow-leaved meadow sweet. The ground layer included Beggar-ticks, Fern species, Sedge species, Grass species and Duckweed.		
ah32	wo95, wo101, wo102	27.34	FOD5-11* Fresh-Moist Sugar Maple-Oak-Beech Deciduous Forest	The most abundant canopy species in this community were sugar maple and white oak with American beech. The understory consisted of sugar maple, long-spined hawthorn, American beech and white oak. Sugar maple saplings were the most abundant ground vegetation along with red raspberry and poison ivy.	Located within Beaver Creek Wetland Complex.	Three species were observed in April 2012: Spring Peeper, American Toad and Chours Frog. Green Frog was observed in May 2012. None observed in June 2012.
			FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.		
ah33	wo103	3.27	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	Surrounded by active agriculture and located adjacent to the Beaver Creek Wetland Complex.	One species observed in April 2012: Spring Peeper (Chorus). Spring Peeper and Chorus Frog observed outside of candidate habitat in April 2012. None observed in May or June 2012. Gray Treefrog observed outside of candidate habitat in June 2012.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah34	wo103, wo105	0.29	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	Surrounded by active agriculture and located adjacent to the Beaver Creek Wetland Complex.	Two species were observed in April 2012: Chorus Frog and American Toad. Gray Tree Frog was observed in May 2012. No species were observed in June 2012.
ah36	wo111	15.58	FOD6-5/SWD2-2/MAS2-4 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with complexes of Green Ash Swamp and Broad-leaved Sedge Shallow Marsh	Dominant species were red and white oak with sugar maple. The sub-canopy consisted of younger sugar maple, hop hornbeam, American beech and American basswood. Sugar maple, hop hornbeam, American beech and blue beech dominated the understory. The ground layer consisted of blackberry species, tartarian honeysuckle, and sedges. Complexed within this community were two wetland communities – green ash mineral deciduous swamp and broad-leaved sedge shallow marsh. Most of the swamp pockets had pools of water and abundant emergent vegetation.	There were cut stumps throughout the community indicating it had undergone logging in the past. Complexed within this community were two wetland communities – green ash mineral deciduous swamp and broad-leaved sedge shallow marsh. Most of the swamp pockets had pools of water at least 20cm deep and abundant emergent vegetation. Contained within the Upper Beaver Creek Wetland Complex.	One species observed in April 2012: Spring Peeper, ~30 individuals; also observed outside of candidate habitat. None observed within candidate habitat in May 2012, however, one species was observed outside of candidate habitat: American Toad. None observed within candidate habitat in June 2012, however, one species was observed outside of candidate habitat: Green Frog.
			CUP3-2/CUM1-1/SWT2-6 White Pine Coniferous Plantation with a complex of Dry-Moist Old Field Meadow and Meadowsweet Mineral Thicket Swamp	The dominant tree species throughout was white pine; this was intermixed with a ground layer typical of old field meadow, consisting of grasses, tall goldenrod, flat-topped bushy goldenrod, and asters. There was also a high proportion of wetter meadow species such as rushes. There were several meadowsweet mineral thicket swamps distributed throughout.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah37	wo112	24.98	SWT2-6 Meadowsweet Mineral Thicket Swamp	Occasional tree species occurred, including ash, swamp white oak and willow. The vegetation was dominated by narrow-leaved meadowsweet with silky dogwood, red-panicled dogwood and red raspberry, while the ground layer consisted of wool-grass, reed-canary grass, broad-leaved cattail, beggar-ticks rush and sedge species.	In general the ground was very moist, with frequent puddling observed. There were several meadowsweet mineral thicket swamps distributed throughout. The grounds may be an old or active research site of some sort. Located within the Beaver Creek Wetland Complex. Adjacent habitat includes cultural meadow and deciduous swamp.	Three species observed in April 2012: Northern Leopard Frog, 1 individual; Chorus Frog (chorus); and American Toad, 1 individual. Chorus Frog and American Toad were also observed outside. Three species were observed in May 2012: Chorus Frog, 1 individual; Green Frog, 5 individuals; and Gray Treefrog, 3 individuals. Gray Treefrog and Greenfrog were also observed outside of the candidate habitat on June 2012.
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		
			FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah38	wo113	21.96	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest with inclusion of deciduous swamp	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	Contained within the Highway 20 and 24 Wetland Complex. Some evidence of disturbance could be seen throughout the site in the form of light logging activities and installation of drainage pipes within areas of the swamp complex.	Two species observed in April 2012: Spring Peeper, ~50 individuals; and Chorus Frog, 3 individuals. Both species were also observed outside the candidate habitat. Two species were observed in May 2012: Green Frog, 5 individuals; and Gray Treefrog (chorus). Both species were also observed outside of the candidate habitat. None observed within the candidate habitat in June 2012; however, Bullfrog was observed outside the candidate habitat.
ah39	wo116	4.04	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	This community was a small pocket of meadow marsh adjacent to the FOD9-1 and surrounded by agricultural fields. There was some surface water over approximately one-quarter of the interior of the community. Contained within the Beaver Creek Wetland Complex.	One species observed in April 2012: American Toad, 1 individual; also observed outside of candidate habitat. None were observed within the candidate habitat in May or June 2012; however, Gray Treefrog was observed outside of the candidate habitat.
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah41	wo122	3.17	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well, with pools of surface water up to 60cm in depth. The soils in this Oak-Sugar maple deciduous forest community had a moisture regime of 5-6.	One species observed in April 2012: Spring Peeper; 1 individual. Spring Peeper was also observed outside of the candidate habitat. No calls in May or June 2012.
			FOD9-1/SWT2-4/SWD1-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Buttonbush Mineral Thicket Swamp inclusion and a Bur Oak Mineral Deciduous Swamp complex	This community had a canopy consisting of White oak, Red oak, Sugar maple and White pine. The sub-canopy contained Hop hornbeam, Blue beech and White pine, while the understory consisted largely of Black cherry, Blue beech, Hop hornbeam and White pine. The ground layer included Sedge species, Large-leaved aster and Millspaugh's blackberry. A Buttonbush Mineral Thicket Swamp occurred within this community and was added as an inclusion. The primary species here included Eastern buttonbush, Winterberry, Red-osier dogwood and Narrow-leaved meadow sweet. Pockets of Bur Oak Mineral Deciduous Swamp were found throughout the above forest community as well.		
			MAS2-4 Broad-leaved Sedge Mineral Shallow Marsh	This marsh community had an understory layer consisting of Narrow-leaved meadowsweet, Eastern Buttonbush, Winterberry, Highbush Blueberry, Common Elderberry and Swamp white oak, with Downy Arrrow-wood. The ground layer consisted of Sedge species with Wool grass, Narrow-leaved cattail, Beggar-ticks and Reed canary grass.		
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah42	wo131, wo133, wo137	10.69	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	Water covered approximately 90% of the area at depths of up to 60cm.	Not surveyed in April 2012. None observed within candidate habitat in May or June 2012. Gray Treefrog and Green Frog observed outside of candidate habitat in May and June 2012.
			CUW1 Mineral Cultural Woodland	There was a dense understory of gray dogwood, swamp maple, and narrow-leaved meadowsweet, and a ground layer of Kentucky bluegrass, creeping cinquefoil, scarlet strawberry, and goldenrod.		
ah43	wo138	24.26	FOD6-5/SWD3-3 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a complex of Swamp Maple Deciduous Swamp.	The canopy consisted of mature red oak, sugar maple, and American basswood. Red oak and sugar maple again dominated the sub-canopy along with hop hornbeam. Sugar maple, American beech, and raspberry species made up the moderately thick understory, while raspberry species, large-leaved aster, and sedges dominated the ground layer. There was a swamp maple swamp complex within the community.	Complexed within this were a few small pockets of red maple mineral swamp, containing shallow pools of water of about 30cm in depth. Contained within the Sucker Creek Wetland Complex.	One species was observed in April 2012: Spring Peeper, 10 individuals; also observed outside of the candidate habitat. None observed within candidate habitat in May 2012; however Chorus Frog was observed outside of candidate habitat. None observed in June 2012.
			FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite	Sugar maple, red oak, large-tooth aspen and hemlock comprised the canopy species. The sub-canopy contained primarily sugar maple, hop hornbeam and American beech. The understory consisted of sugar maple and american beech saplings, with less frequent occurrences of wild red raspberry and Millspaugh's blackberry, while the ground vegetation contained species such as sugar maple, panicled aster, avens, Large-leaved aster, enchanter's nightshade, jack-in-the-pulpit and thimble berry.		
ah44	wo139, wo140, wo141	70.17	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	There were several shallow pools (<60cm deep) throughout and many contained emergent vegetation. These communities occupied a large swathe of the southwestern section of the property. At its southern edge, it sloped very steeply to the adjacent floodplain community. Contained	Not surveyed in April 2012. None observed within candidate habitat in May or June 2012. Gray Treefrog and Green Frog observed outside of candidate habitat in May and June 2012.
			SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	within the Beaver Creek Wetland Complex.	
ah45	wo142, wo217	122.89	FOD9-1/SWD3-1/MAS2-4 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Red Maple Mineral Deciduous Swamp and Broad-leaved Sedge Mineral Shallow Marsh complex	This community had a canopy of Sugar maple, Red oak, White pine and Ash species. The sub-canopy contained Sugar maple, Hop hornbeam, Red oak and White oak. The understory consisted of Sugar maple, American Beech, Hop hornbeam and Blue beech, while the ground layer included Millspaugh's blackberry, Pennsylvania sedge, Maple-leaved viburnum and Wild red raspberry. Areas of Red Maple Deciduous Swamp and Broad-leaved sedge Shallow Marsh were found throughout the forest community and included as a complex.	Water of 15cm in depth was observed at a potential seep where Water-cress was present. The soil in the Oak-Sugar maple deciduous forest were a sandy clay with a moisture regime of 6 and mottles at 25cm. Located within the Port Davidson Slough Forest Wetland Complex. Pooled water of 5-20cm in depth was found throughout the community. Adjacent habitat includes deciduous woodland, marsh and swamp located within the Port	Two species observed in April 2012: Spring Peeper (chorus) and Chorus Frog, 2 individuals. Spring Peeper was also observed outside of the candidate habitat. None observed within candidate habitat in May 2012; howerver one species was observed outside the candidate habitat: Bullfrog. None observed in June 2012.
			MAS2-4 Broad-leaved Sedge Mineral Shallow Marsh	This marsh community had an understory layer consisting of Narrow-leaved meadowsweet, Eastern Buttonbush, Winterberry, Highbush Blueberry, Common Elderberry and Swamp white oak, with Downy Arrrow-wood. The ground layer consisted of Sedge species with Wool grass, Narrow-leaved cattail, Beggar-ticks and Reed canary grass.		
			SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	located within the Port Davidson Slough Forest Wetland Complex.	
ah46	wo147, wo150	210.71	FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.	Contained within the Chippawa Creek Slough Forest Wetland Complex.	Two species observed in April 2012: Spring Peeper, ~9 individuals; and Chorus Frog 2 individuals. None observed within the candidate habitat in May or June 2012. Green Frog and Gray Treefrog were observed outside of the candidate habitat in June 2012.
			SWD 3-1 Red Maple Mineral Deciduous Swamp	The canopy of this community contained red maple with less frequent occurrences of American elm, green ash and trembling aspen. The sub-canopy composition was similar. The understorey included Red maple saplings, american elm, common buckthorn and riverbank grape. Ground cover included species such as cinnamon fern, sensitive fern, beggar ticks, Northern bugleweed and false Solomon's seal.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah47	wo149, wo151, wo152	32.90	SWD3-1/MAS2-9/SAF1-3 Red Maple Mineral Deciduous Swamp with a Forb Mineral Shallow Marsh and Duckweed Floating-leaved Shallow Aquatic complex	The most abundant species in the canopy were Red and Silver maple, with Red oak and American Beech. The sub-canopy was predominately comprised of Red oak, American Beech and Blue Beech and the understory contained some Black ash with Red Osier dogwood. The ground layer consisted of Sensitive fern, Swamp beggar-ticks, Royal fern and Spinulose wood fern. The above swamp community is complexed with small ponds associated with small shallow marshes which are found throughout.	Contained within the Chippawa Creek Slough Forest Wetland Complex. The swamp community is complexed with small ponds associated with small shallow marshes which are found throughout. The soil in the deciduous swamp was found to be a silty very fine sandy clay loam with a moisture regime of 6 and both	None observed in April 2012. Four species observed in May 2012: Spring Peeper (Chorus), Green Frog, 14 individuals; Bullfrog, 4 individuals; Gray Treefrog (chorus). Gray Treefrog was also observed outside of the candidate habitat. Three species observed in June 2012: Green Frog, 5 individuals; Bullfrog, 11 individuals; and Gray Treefrog, 5 individuals.
			MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil		
			CUP3-2 White Pine Coniferous Plantation	White pine dominated the canopy with occasional occurrences of smaller amounts of other species such as white spruce, scotch pine, Largetooth aspen, ash species, red-panicled dogwood, spicebush and red oak. The ground vegetation consisted of grass, sensitive fern, goldenrod and teasel.		
			FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous Forest	The most abundant canopy species in this community included Sugar maple, White ash, Red oak and American basswood. The sub-canopy consisted of species such as Sugar maple, American basswood, White ash, Chinquapin oak and Red oak. Species in the understory included Spicebush, Sugar maple, Common hop tree and White Ash, while the ground layer consisted of Herb robert, goldenrods, Enchanter's nightshade, Solomon's seal species, Blue cohosh, sedge species and Sensitive fern.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah48	wo153	27.33	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species.	The soil was a sandy clay with a moisture regime of 2 with mottles and gley observed at >40cm. Depth to bedrock was >120cm.	None observed in April and May 2012. One species was observed in June 2012: Gray Treefrog; also observed outside of the candidate habitat.
			FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.		
			FOD3-1 Dry to Fresh Poplar Deciduous Forest	Canopy species occurring in this community included Cottonwood species, Trembling aspen, White Ash, Green Ash, Willow species, Sugar maple, American basswood and Red oak . The sub-canopy included Sugar maple, Trembling aspen and Cottonwood species. The understory was comprised of species such as Staghorn sumac, Spicebush, Sugar maple, Trembling aspen, virginia creeper and Gray dogwood, while the ground layer contained Currant species, Spicebush, Tall goldenrod, Canada goldenrod, Wood nettle, Poison Ivy and Sensitive fern.		
			FOD8-1 Fresh-moist Poplar Deciduous Forest	This community is dominated by trembling aspen with grasses in the understory, representing secondary growth on a disturbed site.	This community is very small and borders both	Two species observed in April 2012: Spring Peeper, 5 individuals; and Chorus Frog, 5 individuals. Five species were

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah49	wo160, wo163	20.11	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	small and borders both sides of a drainage ditch. The Marshville candidate habitat Clay Plain Wetland Complex is located directly to the east (separated by a municipal road). Surrounded by agricultural land to the west.	individuals. Five species were observed in May 2012: Spring Peeper, American Toad, Green Frog and Bullfrog (one individual observed of each species), and Gray Treefrog, 15 individuals. Gray Treefrog was also observed outside of candidate habitat. None observed within the candidate habitat in June 2012; however, Greenfrog was observed outside of the candidate habitat.
ah50		0.23	Hedgerow/ Agriculture		Hedgerow runs north-south through the meadow marsh community. Located adjacent to active agriculture.	Not surveyed in April 2012. None observed in May or June 2012.
ah51	wo170	0.27	Hedgerow/ Agriculture		Drain runs through hedgerow along meadow marsh communitiy. Located adjacent to active agriculture.	Not surveyed in April 2012. None observed in May 2012. One species observed in June 2012: Green Frog, 3 individuals.
			FOD6-1 Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest Type	The canopy species found in this community included sugar maple, white ash, red oak and Scots pine. Sub-canopy species present included Sugar maple, American beech, American basswood and hop hornbeam. The understory consisted of poison ivy, wild red raspberry, Virginia creeper and a currant/gooseberry species. The ground layer contained species such as Garlic mustard, wood nettle, aster species, goldenrod species, red raspberry, sedge species and spotted touch-me-not.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah52	wo170	4.47	FOD7-1 Fresh – Moist White Elm Lowland Deciduous Forest	White elm and green ash were the most abundant canopy species, with less frequent occurrences of red maple and trembling aspen. The sub-canopy contained species such as white elm and green ash, The understory consisted of gray dogwood, narrow-leaved meadowsweet, elderberry and wild red raspberry. Rough goldenrod, touch-me-not species, sedges, and sensitive fern made were common species in the ground cover.	Surrounded by active agriculture and located adjacent to a municipal road and agricultural buildings.	Not surveyed in April 2012. None observed within candidate habitat in May or June 2012. Green Frog and Bullfrog observed outside of candidate habitat in June 2012.
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		
ah53	wo177	82.67	SWT2-2 Willow Mineral Thicket Swamp	The canopy layer occasionaly consisted of sparse Ash and Willow species. The understory was comprised of Willow species, Red-panicled dogwood and Spiraea species, with occasional lesser components of Eastern Buttonbush, while the ground layer consisted of Cattails, Reed canary grass, Sedge species and various hydrophitic forbs.	No surface water could be observed. Swamp thicket transverses throughout woodland. Located adjacent to the Beaver Creek Wetland complex. Municipal road divides this community from the complex.	Not surveyed in April. Two species observed in May 2012: Green Frog, 1 individual; and Bullfrog, 2 individuals. Gray Treefrog also observed outside of candidate habitat. Two species observed in June 2012: Green Frog, 3 and Gray Tree Frog, 2 individual.
			CUP3 Coniferous Plantation	The dominant canopy species was young to mid-age spruce trees with a much smaller component of young sugar maple trees scattered throughout. Since it was a young community, canopy cover was more open than is typically seen in coniferous plantations. Ground vegetation was profuse and was dominated by short grasses with occasional occurrences of panicled asters and new-england asters throughout.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah54	wo176	5.66	SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.	Surrounded by active agriculture.	Not surveyed in April 2012. None observed within candidate habitat in May or June 2012. Gray Treefrog, Spring Peeper and Green Frog observed outside of candidate habitat in May 2012.
			FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.		
			FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah56	wo174, wo175, wo180	8.88	FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.	Surrounded by active agriculture and located adjacent to a drain on the southern portion of the property. The deciduous forest extends outside of the zone of investigation with portions extending into the East of Dunville Woodlots.	Not surveyed in April 2012. None observed in May or June 2012.
			CUW1-3* Manitoba Maple Cultural Woodland Type	This community had a canopy consisting of Manitoba maple, white ash, Scots pine and white elm. The understory layer was made up of staghorn sumac, black raspberry and Virginia creeper, while the ground layer consisted of spotted touch-me-not, poison ivy, wood nettle and garlic mustard.		
			FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.	Located adjacnet to disturbed cultural meadow and agricultural field. This vegetation community	Two species observed in Apirl 2012: Spring Peeper, and Chorus Frog. Spring Peeper was also observed outside of the
			SWD4-3 White-birch Poplar Mineral deciduous forest	This community is dominated by trembling aspen, common associates in the canopy include freeman's maple and green ash. The sub-canopy is dominated by trembling aspen and green ash. Riverbank grape is the most prevalent species in the understory.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah57	wo182, wo183	116.54	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	was highly disturbed, with evidence of recreational use including a trailer, shed, chairs and mown areas and trails throughout. An open pond is located adjacent to the candidate habitat.	also observed outside of the candidate habitat. Two species observed in May 2012: American Toad and Green Frog. Green Frog was also observed outside of the candidate habitat. Two species observed in June 2012: Green Frog and Gray Tree Frog.
			FOD3-1 Dry to Fresh Poplar Deciduous Forest	Canopy species occurring in this community included Cottonwood species, Trembling aspen, White Ash, Green Ash, Willow species, Sugar maple, American basswood and Red oak . The sub-canopy included Sugar maple, Trembling aspen and Cottonwood species. The understory was comprised of species such as Staghorn sumac, Spicebush, Sugar maple, Trembling aspen, virginia creeper and Gray dogwood, while the ground layer contained Currant species, Spicebush, Tall goldenrod, Canada goldenrod, Wood nettle, Poison Ivy and Sensitive fern.		
ah58	wo184	49.62	SWD 2-3* Ash-Poplar Deciduous Mineral Swamp	This community was dominated by green ash in the canopy with eastern cottonwood and trembling aspen also present. The understory consisted of young green ash, wild red raspberry, narrow-leaved meadowsweet and gray dogwood. Virginia creeper was the dominant ground cover within the community with sumac and jewelweed also present.	Surrounded by active agriculure and connected to the Moulton East Wetland Complex by a drainage feature extending westward on the southern portion of the feature.	One species observed in April 2012: Spring Peeper (chorus); and Green Frog observed outside of candidate habitat. None observed within candidate habitat in May 2012; however, American Toad and Green Frog observed outside of candidate habitat. One species observed in June 2012: Green Frog, 1 individual.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah59	wo191, wo192	36.28	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	Located adjacent to the Moulton East Wetland Complex.	Not surveyed in April 2012. One species observed in May 2012: American Toad, 1 individual. None observed in June 2012.
ah60	wo189, wo190	26.07	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	Vernal pooling occurred throughout the community.	None observed.
			FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.		
			CUM1-1 Dry-Moist Old field cultural meadow	This community consisted of several forbs and grasses in varying composition and dominance including Goldenrod species, ox-ey daisy, wild teasel, wild carrot, tufted vetch, reed canary grass, Awnless brome, Scarlet strawberry, Knapweed, Kentucky bluegrass		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			FOD7-2 Fresh – Moist Ash Lowland Deciduous Forest	This community had a canopy consisting of green ash with smaller components of shagbark hickory, slippery elm, eastern cottonwood and trembling aspen. The sub-canopy was made up of species such as green ash, sugar maple, white birch and white elm. The understory species consisted of hop hornbeam, gray dogwood, sugar maple, green ash, blue beech common, buckthorn and spicebush. Raspberries, reed canary grass, avens species, riverbank grape, panicled aster, rough goldenrod, jewelweed, virginia creeper, yellowish enchanters nightshade and moneywort were common species present in the ground cover.		
			CUW1-3*/MAM2-6 Freeman Maple Cultural Woodland with a Broad-leaved Sedge Mineral Meadow Marsh inclusion	The canopy of this community consisted of Cottonwood species, with the sub-canopy containing both Cottonwood and Freeman's maple. The understory included Freeman's maple as well as Canada goldenrod, Tall white aster, Common boneset. Evidence of past clearing was observed and this community appears to be the result of regeneration. A broad-leaved sedge meadow marsh occurred as an inclusion within the woodland community. The cultural woodland contained a clay-loam soil with an organics layer of 22.8cm in depth and a moisture regime of 4-5. Depth to bedrock was >120cm.		
			SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	Small pools of surface water were observed throughout the community. The soil was organic (Om) with a moisture regime of 7.	

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah61	wo193, wo194	291.42	CUT1-7* Red Osier Dogwood Cultural Thicket	The sub-canopy layer occasionally contained species such as Spicebush, while the understory was comprised of Canada goldenrod, Tall white aster, Spicebush and Red osier dogwood. Species occurring less frequently included staghorn sumac, American elm, Bitternut Hickory and Red Raspberry. Tall white aster was also a ground layer component.	Depth to bedrock was >120cm. Community is contained within the Moulton Wetland West Complex. Evidence of disturbance were observed as a small shed was found at the edge of this community. Surface water was also observed throughout and the community was located adjacent to a large area of open water. A drainage ditch also occurred along its border.	Two species observed in April 2012: Spring Peeper and Chorus Frog; both species also observed outside of candidate habitat. Two species were observed in May 2012: Green Frog and Bullfrog. Green Frog was also observed outside of candidate habitat. Two species observed in June 2012: American Toad and Green Frog.
			FOD9-2/MAM2-11* Fresh-Moist Oak-Maple Deciduous Forest with a Common Reed Mineral Meadow Marsh inclusion	This community had a canopy consisting of Red oak, Red maple and Green ash, with few Black cherry and Willow species. The sub-canopy also contained Red oak and Red maple with sparse occurrence of Black cherry and Green ash. The understory included mainly spicebush, with American beech and Currant species, while the ground layer was comprised of Calico aster, Canada goldenrod, Reed-canary grass and Riverbank grape. A Common reed meadow marsh inclusion was identified within the above community.		
			SWD5-1 Black Ash Organic Deciduous Swamp	The canopy in this community consisted of Black ash, Red maple and Yellow birch, with less common occurrances of Freeman's maple, Crack willow and White elm. The understory contained Spicebush and occasionally Crack willow and willow speices. The ground layer species included Sensitive fern, Moss species, Tall white aster and Spinulose wood fern.		
			FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	The canopy in this community was dominated by Green ash, with Red maple and sparse White elm and Trembling aspen. Green ash and White elm were the most abundant species in the sub-canopy, with infrequent occurrences of Red maple and Trembling aspen. The understory included Green ash, White elm, Staghorn sumac and Nannyberry, while the ground layer was largely Sensitive fern with Canada and Tall goldenrods and Raspberry species. An inclusion of a Cattail Mineral Shallow Marsh was identified within the above community.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			MAS2-1/SAF1-3 Cattail Mineral Shallow Marsh with a Duckweed Floating-leaved Shallow Aquatic inclusion	This marsh community consisted largely of Broad-leaved cattail and Reed-canary grass, with components of Canada and Tall goldenrods. Calico aster was also present. A Duckweed Floating-leaved Shallow Aquatic community occurred as an inclusion within the shallow marsh community.		
			CUT1-4 Gray Dogwood Cultural Thicket	The canopy of this community type occasionally contained sparse occurrences of species such as Manitoba Maple, Bur Oak, White oak, Red maple, White Ash and American Elm. The understory of this community was comprised largely of Gray dogwood, with Hawthorn species, Narrow-leaved meadowsweet, staghorn sumac, and Rose species. The ground layer included Grass species, New England aster, Oxeye daisy, Riverbank grape and wild carrot.		
ah62	wo55	14.75	SWD1-1 Swamp White Oak Deciduous Swamp	The canopy was dominated by swamp white oak, with less common occurrences of red maple, red oak and green ash. The understory consisted of species such as narrow-leaved meadowsweet and red-panicled dogwood. Reed-canary grass, sensitive fern, blue flag iris and wild red raspberry were species occurring in the ground layer.	Contained within St. Anne's Slough Forest Wetland Complex.	Not surveyed in April 2012. None observed in May or June 2012.
			FOD5-2 Dry-Fresh Sugar Maple – Beech Deciduous Forest	The canopy was dominated by sugar maple with American beech, trembling aspen, black cherry, bur oak and red oak. The sub-canopy contained sugar maple, American beech and hop hornbeam. The understory also contained american beech, sugar maple and hop hornbeam as well as species such as black walnut, maple-leaved viburnum and witch hazel. The ground layer contained species such as heart-leaved aster, large leaved aster, hairy solomon's seal, virginia creeper, blue cohosh, wild lily of the valley and beech drops.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah63	wo67	48.63	FOD9-2 Fresh-Moist Oak-Maple Deciduous Forest	This community had a canopy consisting of such species as Freeman's maple and Red maple, with Red oak, White oak, Bur oak and Sugar maple, with less common occurrances of Hop Hornbeam, Shagbark hickory and Green Ash. Sub-canopy species included Sugar maple, Freeman's maple and Red maple, Blue Beech with some Red oak. The understory contained Spicebush, with Currant species and Green, Maple-leaved viburnum ash and Maple species. The ground layer contained Rough Goldenrod, Large-leaved aster, Sensitive fern, Moss species, Currant species and Sedge species.	Adjacent habitat includes deciduous swamp and a treed hedgerow. Contained within the Silverdale Wetland Complex.	Not surveyed in April 2012. One species observed in May 2012: Green Frog, 5 individuals. Gray Treefrog observed outside of candidate habitat in May 2012. None observed in June 2012.
			SWD3-3 Swamp Maple Mineral Deciduous Swamp	The canopy was dominated by Freeman's maple, with green ash, red maple, swamp white oak and white elm; while the sub-canopy was made up of Freeman's and red maple, green ash and hop hornbeam. The understory consisted of dogwood species and narrow-leaved meadowsweet with buttonbush and winterberry. Sedges, ferns such as sensitive fern and eastern marsh fern, and beggar-ticks, fowl manna grass and false nettle were common species in the ground layer.		
			CUW1 Mineral Cultural Woodland	The average height of trees in this community was 6 to 8 m and the most abundant species were swamp maple, green ash and trembling aspen. There was a dense understory of gray dogwood, swamp maple, and narrow-leaved meadowsweet, and a ground layer of Kentucky bluegrass, creeping cinquefoil, scarlet strawberry, and goldenrod.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah64	wo63, wo69	200.88	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	Dominant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	Soils were variable through the community, with a clay dominated soil in some areas and a sandier, siltier component in others. Mottles were present within 17cm and 25 cm of the surface respectively for each type. Smaller swamp pockets were less diverse, containing shallow pools (5 -10cm) with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	Two species were observed in April 2012: Spring Peeper and Chorus Frog. Three species were observed in May 2012: Green Frog, Gray Treefrog, and Bullfrog. Gray Treefrog was also observed outside of the candidate habitat. None observed within candidate habitat in June 2012; however, Northern Leopard Frog observed outside of candidate habitat.
			FOD9-1/SWD2-2 Fresh-Moist Oak-Sugar Maple Deciduous Forest with a Green Ash Mineral Deciduous Swamp complex	This community had a canopy comprised predominately of Sugar maple, Red oak and White oak. The sub-canopy consisted of mainly Sugar maple with some White ash, Hop hornbeam, Red oak and American beech. The understory contained mostly Sugar maple and American beech, while the ground cover consisted of Large-leaved aster, Sedge species and Goldenrod species. A deciduous swamp is Complexed throughout this community as there were numerous low-lying areas containing hydrophilic species (Highbush blueberry, Winterberry) and some pools.		
			MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah65	wo67	0.99	SWT2-2 Willow Mineral Thicket Swamp	The canopy layer occasionaly consisted of sparse Ash and Willow species. The understory was comprised of Willow species, Red-panicled dogwood and Spiraea species, with occasional lesser components of Eastern Buttonbush, while the ground layer consisted of Cattails, Reed canary grass, Sedge species and various hydrophitic forbs.	The community contained a pool of standing water of at least 1 to 2ft in depth over 30% of its area. There was an inclusion of cattail shallow marsh. Contained within the Silverdale Wetland Complex.	Two species were observed in April 2012: Spring Peeper (chorus), and Chorus Frog, 5 individuals. Spring Peeper was also observed outside of the candidate habitat. Two species were observed in May 2012: Green Frog, 2 individuals; and Bullfrog, (chrous). Bullfrog was also observed outside of the candidate habitat. None observed in June 2012.
ah66	wo106	7.88	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	Dominant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	Contained within the Beaver Creek Wetland Complex.	One species observed in April 2012: Spring Peeper; 5 individuals. Spring Peeper was also observed outside of the candidate habitat. Three species observed in May 2012: Spring Peeper, ~14 individuals; Chrous Frog, ~ 15 individuals; and American Toad, 1 individual. Gray Treefrog was heard outside of candidate habitat. None observed in June 2012.
ah67	wo105	6.28	FOD9-1 Fresh to Moist Oak-Sugar Maple Deciduous Forest	Red oak was the dominant canopy cover in this community, Sugar maple ash and basswood are present as associates. Understory vegetation includes gray dogwood and ground cover was undetermined.		Not survyed

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah68	wo106	12.78	FOD6-5/SWD1-2 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest with a Bur Oak Mineral Deciduous Swamp complex	Dominant canopy species were red oak, sugar maple, American beech and white oak. The sub-canopy consisted of sugar maple, American beech and hop hornbeam. The understory was made up of primarily sugar maple, hop hornbeam, black cherry and American beech. Large-leaved aster, red oak, raspberry species, and sugar maple dominated the ground layer. The community contained a bur oak mineral deciduous swamp complex that was variable in terms of structure and species composition. In general, smaller swamp pockets were less diverse, containing shallow pools with a closed canopy overhead, while larger pockets contained higher proportions of shrubs such as winterberry, highbush blueberry, and eastern buttonbush, and were richer in ferns and sedges.	Contained within the Beaver Creek Wetland Complex. Evidence of hunting and logging was observed. The soil in the deciduous forest community was a fine to very fine sandy clay with mottles and gley observed at 20cm. Approximately 60cm of surface water was present in the swamp complex.	Two species observed in April 2012: Spring Peeper (chorus), Chorus Frog. Four species were observed in May 2012: Northern Leopard Frog, Spring Peeper, , Gray Treefrog and American Toad. Spring Peeper and Gray Treefrog were also observed outside of the candidate habitat. None observed in June 2012.
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.		
ah69	wo107, wo108	4.50	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	Contained within the Beaver Creek Wetland Complex and within the Highway 20 nd 24 Wetland Complex. There were numerous shallow pools throughout. Adjacent habitat includes shallow marsh and deciduous thicket.	Two species observed in April 2012: Spring Peeper and Chorus Frog. Spring Peeper and American Toad were observed outside of the candidate habitat. None observed in May 2012. None observed within the candidate habitat in June 2012; however, Gray Treefrog was observed outside of the candidate habitat.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah70	wo107, wo108	16.53	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	Contained within the Beaver Creek Wetland Complex.	Three species observed in April 2012: Spring Peeper, 7 individuals; Chorus Frog, 1 individual; and American Toad, 1 individual. One species observed in May 2012: Green Frog, 5 individuals. Two species observed in June 2012: Green Frog, 5 individuals; and Bullfrog, 2 individuals.
ah71	wo111	5.75	FOD9-1/SWD2-2/MAS2-4 Fresh – Moist Oak – Sugar Maple Deciduous Forest with a Green Ash Swamp complex and inclusion of Broad-leaved Sedge Mineral Shallow Marsh	Dominant canopy species were red and white oak with sugar maple and ash species. Smaller components of red maple and swamp white oak were also present and primarily occupied a transition zone between the forest and swamp communities. The sub-canopy consisted of sugar maple with a much smaller proportion of hop hornbeam and American beech. The understory appeared to consist exclusively of sugar maple, and the dominant ground layer species were wild red raspberry and avens. A green ash swamp was complexed within the community as well as a broad-leaved sedge shallow marsh.	There was evidence of recent and past logging activity. A green ash swamp was complexed within the community and there was a small broad-leaved sedge shallow marsh located along the western edge.	One species observed in April 2012: Spring Peeper, 10 individuals. Spring Peeper was also observed outside of candidate habitat. Two species were observed in May 2012: American Toad, 1 individual and Gray Treeforg, 1 individual. Gray Treefrog, American Toad and Greenfrog were observed outside of the candidate habitat. None observed in June 2012.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah72	wo113	2.55	FOD6-5 Fresh-Moist Sugar Maple-Hardwood Deciduous Forest	Canopy species in this community include Sugar maple, Red Oak, White Oak and Shagbark hickory, Black Cherry and American Basswood with American beech. The sub-canopy was comprised of American beech, with Hop hornbeam and Sugar maple. The understory included American beech, with some Hop hornbeam and Blue beech. The ground cover included Canada Goldnerod, American beech, Plantain-leaved sedge, Scarlet strawberry, Sweet scented bedstraw, wild sarsaparilla, twisted stalk, smooth blackberry, Avens species and grass species.	The soils were clay dominated and the moisture regime was 5. A drainage ditch ran through the community at its narrowest section. Trails and evidence of logging were observed within the community. Adjacent habitat includes deciduous swamp and woodland contained within the Highway 20 and 24 Wetland Complex.	None observed within the candidate habitat. One species was observed outside the candidate habitat in May 2012: Gray Treefrog.
ah73	wo117, wo121	2.24	SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.	This was a small, linear community associated with a drainage ditch/creek that traverses the property. The forest inclusion was located on a patch of higher ground sloping eastwards within the same community.	One species was observed in April 2012: Chorus Frog, 10 individuals. None observed in May or June 2012.
ah74	wo123, wo124	0.57	FOD5-8 Dry-Fresh Sugar Maple-White Ash Deciduous Forest	The most abundant canopy species in this community included Sugar maple, White ash, Red oak and American basswood. The sub-canopy consisted of species such as Sugar maple, American basswood, White ash, Chinquapin oak and Red oak. Species in the understory included Spicebush, Sugar maple, Common hop tree and White Ash, while the ground layer consisted of Herb robert, goldenrods, Enchanter's nightshade, Solomon's seal species, Blue cohosh, sedge species and Sensitive fern.	Adjacent habitat includes MAM and CUM communities, which are contained within the Beaver Creek Wetland Complex.	None observed in April or June 2012. Four species were observed in May 2012: Spring Peeper, ~10 individuals; Chorus Frog, ~13 individuals; American Toad, 1 individual; and Gray Treefrog, 2 individuals. Chorus Frog was also observed outside of the candidate habitat.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah75	wo123, wo124	4.28	FOD9-6* Fresh-Moist Hickory-Ash-Oak-Elm Deciduous Forest Type	This community was assessed from the property line due to restricted property access. This community was composed of shagbark hickory, green ash, bur oak and American elm.	Adjacent habitat includes marsh and cultural meadow communities, which are contained within the Beaver Creek Wetland Complex.	One species was observed in April 2012: Spring Peeper (chorus); also observed outside of the candidate habitat. Three species were observed in May 2012: Spring Peeper, 9 individuals; Chorus Frog, 1 individual; and American Toad, 1 individual. Gray Treefrog was observed outside of the candidate habitat. None observed in June 2012.
ah76	wo154	36.38	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.	Some obvious deep depressions which could become seasonally flooded were observed in this community. The soils in this community were a fine silty-clay-loam with a moisture regime of 2.	None observed within candidate habitat. Two species were observed outside of candidate habitat in April 2012: Spring Peeper and Chorus Frog.
			SWD2-2 Green Ash Mineral Deciduous Swamp	The canopy species consisted of green ash, with white elm, oak species, red maple, silver maple and shagbark hickory. White elm and green ash made up the sub-canopy. The understory layer consisted of Freeman's maple and green ash saplings, spicebush, virginia creeper, maple leaved vibirnum, while the ground layer often contained species such as reed-canary grass, Spotted jewelweed, sensitive fern, jack in-the-pulpit, bladder sedge species and panicled-aster made up the ground layer.		

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
			FOD5-9 Dry-Fresh Sugar Maple-Red Maple Deciduous Forest	The canopy of this community consisted of Sugar maple and Red maple in roughly equal proportions, with some Red oak and White birch. The sub-canopy included Sugar maple and Red maple, with Shagbark hickory and Red oak. The understory contained Blue beech and American beech with less common occurrences of American elm and White birch.		
ah78	wo178	38.93	FOD5-2/SWD3-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest Type	The most abundant canopy species in this community were American Beech and Sugar Maple with some black cherry and yellow birch. The understory consisted primarily of young sugar Maple and American beech with ironwood and black cherry also present. Jack in the pulpit and riverbank grape was the dominant ground vegetation, followed by Canada mayflower and trillium.	Adjacent to the East of Dunville Woodlots.	One species observed in April 2012: Spring Peeper (chorus). Spring Peeper also observed outside of candidate habitat. None observed in May or June 2012.
ah79	wo196	9.40	FOD9-1 Fresh-Moist Oak-Sugar Maple Deciduous Forest	Canopy species in this community included red oak, bur oak, sugar maple, green ash, shagbark hickory, american basswood and american elm. The sub-canopy consisted of sugar maple, green ash, hop hornbeam and blue beech. The understory was comprised of species such as sugar maple, Elderberry, American beech, choke cherry, blue beech, red panicled dogwood, raspberry species, witch hazel and spicebush. Spotted touch-me-not, large leaved aster, may-apple, rough goldenrod, spotted cranes bill, white avens and virginia creeper were common ground cover species.	Surrounded by agricultural field.	Two species observed in Apqil 2012: Spring Peeper (chorus); and Chorus Frog (Chorus); both also observed outside of the candidate habitat. None observed in May 2012. One species observed in June 2012: Gray Treefrog, 3 individuals; also observed outside of candidate habitat.
ah80	wo88, wo91	0.06	MAM2 Mineral Meadow Marsh	This community was composed of reed canary grass and soft rush, with various species of sedge. Occasional black walnut and ash occurred in the canopy layer.	There was some shallow surface water of 5 to 10cm throughout. Grassy drain extended from the residence on the east to the end of property on the west.	One species observed in April 2012: Chorus Frog; also observed outside of candidate habitat. No calls observed in May or June 2012.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah81	wo88, wo91	0.05	MAM2 Mineral Meadow Marsh	This community was composed of reed canary grass and soft rush, with various species of sedge. Occasional black walnut and ash occurred in the canopy layer.	Surrounded by active agriculture.	One species observed in April 2012: Spring Peeper, 1 individual. Spring Peeper and Chorus Frog were observed outside of candidate habitat in April 2012. Not surveyed in May 2012. None observed in June 2012.
ah82	wo37, wo38	0.67	FOD5-3 Dry-Fresh Sugar Maple-Oak Deciduous Forest	This community had a canopy dominated by Sugar maple, with Red oak, White oak, American basswood and Eastern cottonwood. The sub-canopy also included Sugar maple, with Red oak, hop hornbeam, white ash, American basswood, american Beech and Blue beech, while the understory consisted of Sugar maple, Red oak, Millspaugh's blackberry, chokecherry, American beech and Blue beech. Ground cover species included raspberry species, goldenrod, Jack in the pulpit, Pennsylvania sedge, Big-leaf aster and creeping bugleweed.	Contained with Upper Sixteen Mile Creek Wetland Complex. Adjacent habitat includes Cultural thicket, meadow marsh and deciduous woodland	None observed in April or June 2012. Two species observed in May 2012: Green Frog, 2 individuals; and Gray Treefrog.
			MAM2-11* Foxtail Mineral Meadow Marsh	This community contained a ground layer of a foxtail species with lesser components of beggar-ticks, cattail and reed canary grass.		
ah87	wo129	0.09	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	No Suitable Habitat	No Siutable Habitat
ah88	wo120	0.14	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, various grass species and Hemlock water-parsnip.	Located within an active agricultural field and adjacent to a deciduous swamp.	No calls observed in April or June 2012. One species was observed in May 2012: Gray Treefrog, 2 individuals.

Table 4.9 Amphibian Woodland Habitat

Feature No.	Woodland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah89	wo66	0.97	SWT2-6 Meadowsweet Mineral Thicket Swamp	Occasional tree species occurred, including ash, swamp white oak and willow. The vegetation was dominated by narrow-leaved meadowsweet with silky dogwood, red-panicled dogwood and red raspberry, while the ground layer consisted of wool-grass, reed-canary grass, broad-leaved cattail, beggar-ticks rush and sedge species.	One area indicative of vernal pooling was located along the east side of this community, adjacent to an area of open aquatics. Contained within the St. Anne's Slough Forest Wetland Complex.	Two species observed in April 2012: Spring Peeper (chorous), and Chorus Frog, 1 individual. Two species observed in May 2012: Green Frog, 3 individuals; and Gray Treefrog (chorus). None observed in June 2012.
			MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, various grass species and Hemlock water-parsnip.		
ah90	wo52	0.36	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, various grass species and Hemlock water-parsnip.	Adjacent habitat includes deciduous swamp and a treed hedgerow. Contained within the Silverdale Wetland Complex.	Not surveyed in April 2012. One species observed in May 2012: Green Frog, 1 individual. None observed in June 2012.

Table 4.10 Amphibian Wetland Habitat

Feature No.	Wetland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah4	we24	0.87	MAM2-2 Reed-canary Grass Mineral Meadow Marsh SWT2-13* Dogwood Mineral Thicket Swamp Type	Found throughout this property, this community is dominated by reed-canary grass. Reed-canary grass was the sole vegetation species within this community.	Located adjacent to a hedgerow and agricultural field. Contained within the Lower Twenty Mile Creek Wetland Complex.	None observed.
ah7	HR	0.11	HR/MAM2-2 Hedgerow adjancet to Reed-canary Grass Mineral Marsh	Hedgerow	Located adjacent to a small meadow marsh community.	None observed.
ah8	we73	0.18	SWT2-9 Grey Dogwood Mineral Thicket Swamp	This community had a sparse canopy (<25% cover) of white elm. The ground vegetation consisted of narrow-leaved meadow-sweet, reed canary grass, and spotted touch-me-not.	The area receives agricultural drainage input resulting in soil moisture in some locations however there was no surface water observed.	None observed within station. One species observed outside of station in April 2012: Spring Peeper.
ah11	we114	0.30	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	This was a small hedgerow-sized strip of meadow marsh dominated by reed canary grass with some scattered narrow-leaved meadowsweet, willow, and dogwood species.	Adjacent land use includes residential and active agriculture. Station located adjacent to municipal road.	One species was observed in April 2012: American Toad, 1 individual. None observed within station in May 2012, however, two species were observed outside of station: Green Frog and Bullfrog. None observed in June 2012.

Table 4.10 Amphibian Wetland Habitat

Feature No.	Wetland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah16	we124	1.58	MAM Mixed Marsh with a complex of Meadowsweet Mineral Thicket Swamp	Variable in terms of species composition, with no dominance of either forbs or graminoids. Rushes, new-England aster, willow herb, and a smartweed species were the dominant species growing in mixed patches. There was a narrow-leaved meadow-sweet thicket swamp complexed throughout the community.	This community is a narrow marsh that runs along a portion of the western edge of the property, and represents an unplowed drainage area within surrounding agricultural fields. Some surface water was present in shallow patches.	One species observed in April 2012: American Toad, 1 individual. None observed within station in May 2012; however, two species observed outside of station: Spring Peeper and Gray Treefrog. None observed in June 2012.
ah18	we178	0.05	SWT2-4 Buttonbush Mineral Thicket Swamp	Canopy height did not exceed 1.5m and exhibited heavy dieback but with vigorous regeneration within the ground cover. No other woody species were observed. Herbaceous species consisted largely of pale smartweed, with fewer occurrences of blue vervain, reed-canary grass, and sedge/rush species.	This was a small community centered within an agricultural field. Surface water was present with a depth of approximately 10cm.	Two species observed in April 2012: Spring Peeper, 5 individuals; and Chorus Frog, 2 individuals. None observed within station May 2012; however, two species observed outside of station: Chorus Frog and Gray Treefrog. None observed in June 2012.
ah23	we202	0.26	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	Dominant species was reed-canary grass, followed by smaller components of nodding beggar ticks and smartweed.	There was approximately 18cm of water pooled under the vegetation and a small duckweed dominated open aquatic inclusion at its north end.	One species observed in April 2012: Chorus Frog, 1 individual. None observed within station in May 2012; however, two species observed outside of station: Chorus Frog and Gray Treefrog. None observed in June 2012.

Table 4.10 Amphibian Wetland Habitat

Feature No.	Wetland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah24	we203	0.49	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	Dominated by reed-canary grass with smaller amounts of teasel and goldenrod closer to its edges.	Some surface water up to 20cm deep was present over approximately 20% of its area. There was a small open aquatic inclusion with duckweed in its center.	Two species observed in April 2012: Chrous Frog, 3 individuals; and American Toad, 2 inidividuals. Three species observed in May 2012: Chrous Frog, 3 individuals; Green Frog, 2 individuals; and Gray Treefrog, 3 inidividuals. Two species were observed outside of the station in May 2012: Spring Peeper and Gray Treefrog. None observed in June 2012.
ah25	OA	0.67	OA Open Aquatic	Open aquatic and fallow	Located adjacent to a manure storage pile and active agricultural land.	None observed in April or May 2012. One species observed in June 2012: Bullfrog, 1 individual.
ah31	we237	0.37	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, with lesser components of various grass species, Hemlock water-parsnip, American Elm, Green Ash, Willow species, Braod-leaved Cattail, common Elderberry, Narrow-leaved Meadowsweet, Dogwood species and Goldenrod species.	The community was associated with a drainage feature. Located adjacent to a municipal road and agricultural land.	One species observed in April 2012: Spring Peeper (chorus). Spring Peeper was also observed outside of candidate habitat. One species observed in May 2012: Gray Treefrog, ~50 individuals. Gray Treefrog was also observed outside of candidate habitat.

Table 4.10 Amphibian Wetland Habitat

Feature No.	Wetland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah35	we236	0.27	MAS2-4 Broad-leaved Sedge Mineral Shallow Marsh	The predominate species in this community were Reed canary grass and Smartweed species.	Located within an active agricultural field and adjacent to a municipal road intersection.	None observed in April 2012. Four species were observed in May 2012: Spring Peeper, ~13 individuals; Chorus Frog, ~15 individuals; American Toad, 5 individuals; and Gray Treefrog, 1 individual. Gray Treefrog was also observed outside of the station. One species observed in June 2012: Greenfrog, 1 individual.
ah40	we292	0.63	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	There was a very sparse canopy layer of scattered shagbark hickory and ash species. The thin understory consisted of red-panicled dogwood, ash species, and hawthorn. The thick ground layer was dominated by reed-canary grass along with scattered goldenrods and cattail species.	Adjacent land use includes active agriculture.	None observed within station. Gray Treefrog observed outside of station in June 2012.
ah55	OA	0.38	OA Open Aquatic	Open aquatic	Open aquatic area is located adjacnet to hedgerow, agricultural field and meadow marsh communtiy.	Not surveyed in April 2012. Two species observed in May 2012: Green Frog, 1 individual; and Bullfrog, 2 individuals. Gray Treefrog and Green Frog observed outside of station. Two species observed in June 2012: Green Frog, 1 individual; and Bullfrog, 1 indivudual.
ah77	OA	0.24	CUM1-1/MAM2-2 Dry-Moist Old field cultural meadow with a Reed-canary Grass Mineral Meadow Marsh inclusion	Trees within the community are limited to a few red maple saplings while shrubs are limited to a few willows. Herbaceous vegetation dominates the community and grasses, goldenrod and horsetail species are dominant.	This community is small and surrounded by agricultural fields.	None observed in April and May 2012. Two species observed in June 2012: Northern Leopard Frog, 3 individuals; and Greenfrog, 6 individuals. Greenfrog was also observed outside of the station.

Table 4.10 Amphibian Wetland Habitat

Feature No.	Wetland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah83	we238	0.11	SWT2-2 Willow Mineral Thicket Swamp	Sparse Ash species, Willow species and Spiraea species; while the ground layer consisted of Reed canary grass and Sedge species.	Community surrounded by active agriculture.	Three species observed in April 2012: Spring Peeper, 5 individuals; Chorus Frog (Chorus); and American Toad, 1 individual. None observed within station in May or June 2012. Green Frog and Bullfrog observed outside of station in May and June 2012.
ah84	we327	0.03	MAM2-2 Reed-canary Grass Mineral Meadow Marsh	The most abundant species in this community included Reed-canary grass, various grass species and Hemlock water-parsnip.	Pooled and running water of approximately 5cm in depth was present throughout and was observed running below ground.	No calls observed in April 2012. One speices observed in May 2012: Green Frog, 7 individuals. Bullfrog was observed outside of the station in May 2012. None observed within the station in June 2012; however, Green Frog and Bullfrog were observed outside of the station.
ah85	we348	0.07	MAS2-1 Cattail Mineral Shallow Marsh	This community is dominated by Broad-leaved cattail. Other species present included Silky dogwood, Reed canary grass, Canada goldenrod, New England aster, Tall goldenrod, Chicory and Birds-foot trefoil. Occasional canopy species included eastern cottonwood, black willow and green ash.	Surrounded by active agriculture and located adjacent to a municipal road.	None observed in April 2012. One species observed in May 2012: Green Frog, 3 individuals. Green Frog and Gray Treefrog also observed outside of candidate habitat. One species observed in June 2012: Green Frog, ~10 species.

Table 4.10 Amphibian Wetland Habitat

Feature No.	Wetland Feature No.	Feature Size (ha)	Vegetation Community Type	Description of Type	Attributes, Characteristics and Functions	Species Presence
ah91	we215	0.44	MAS2-10* Spike-rush Mineral Shallow Marsh	This community consisted of a shallow marsh containing spike-rush, beggar-ticks, and a bur-reed species.	The moisture regime was variable throughout the community but fell between 4 and 6 due to the location of the mottles in the soil profile. In some areas the soils were clay dominated and had a moisture regime of 6, in others there was a higher sand content and mottles at 40cm. There was evidence of logging and recreational activities taking place within the community and its complex. Contained within the Highway 20 and 24 Wetland Complex. Water was present within the ditch, ranging from 5 to 20cm deep. Adjacent land use includes active agriculture and a railine.	No calls observed in 2012.

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we1	0.687	Marsh	Palustrine	FOD7-2/MAS2-1 Fresh-Moist Ash Lowland deciduous Forest with a Cattail Mineral Shallow Marsh inclusion	116m	31	No open water	Headwater; 8.5ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature predominantly Clay Loam Soil	None known to be present	Approximately half of wetland contains deer congregation area (MNR)	Not Present
we5	0.871	Swamp	Palustrine	SWT2-9	20m	43	No open water	0.9ha catchment area	Permanent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Present
we20	0.687	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	125m	38	No open water	186.8ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Present
we28	1.151	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	23m	39	Type 2	1193.0ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Silty Clay Loam Soil	None known to be present	None confirmed	Present
we47	1.59	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	12m	36	Type 1	169.1ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Silty Clay Loam Soil	None known to be present	None confirmed	Present
we51	2.206	Marsh/ Swamp	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh MAS2-1 Cattail Mineral Shallow Marsh SWD2-2 Green Ash Mineral Deciduous Swamp	28m	54	No open water	5.2ha catchment areas	No Surface Water Feature Present	Marsh/Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we94	0.996	Marsh/ Swamp	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh SWT2-9 Gray Dogwood Mineral Thicket Swamp	118m	46	No open water	2.5ha catchment area	No Surface Water Feature Present	Marsh/Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we95	0.712	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	271m	44	No open water	141.8ha catchment area	Not a REA waterbody (grassed swale)	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we118	0.778	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	69m	57	No open water	42.3ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we131	1.508	Marsh	Palustrine	MAS2-1/MAM2-2 Cattail Mineral Shallow Marsh with a Reed Canary Grass Mineral Meadow Marsh inclusion	18m	50	No open water	5.9ha catchment areas	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we147	0.62	Marsh	Palustrine	MAS2-1 Cattail Mineral Shallow Marsh	43m	59	No open water	177.0ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we150	1.853	Swamp	Palustrine	SWD/CUW Deciduous Swamp with Cultural Woodland Inclusion	37m	50	No open water	37.3ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we160	0.74	Marsh	Palustrine	MAS2-2 Bulrush Mineral Shallow Marsh MAM2-1 Bluejoint Mineral Meadow Marsh MAM2-2 Reed Canary Grass Mineral Meadow Marsh	73m	40	No open water	69.6ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we164	1.93	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	43m	39	No open water	506.0ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we166	1.51	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	40m	48	No open water	776.3ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Palustrine feature predominantly Silty Clay Soil	None known to be present	Raptor Wintering Area	Present
we186	0.591	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	269m	53	No open water	371.5ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we202	0.935	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	21m	37	No open water	2.5ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we210	1.242	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh MAS2-1 Cattail Mineral Shallow Marsh	11m	40	No open water	7.6ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we216	0.711	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	17m	45	No open water	173.8ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we218	0.919	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	17m	29	No open water	0.9ha catchment areas	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we222	0.502	Marsh	Palustrine	MAS2-1 Cattail Mineral Shallow Marsh	21m	48	No open water	4.8ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we231	2.984	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	141m	41	Type 1	329.3ha catchment areas	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we237	1.38	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	289m	47	Type 2	247.3ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we240	0.913	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	378m	35	Type 2	301.8ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we269	0.514	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	353m	42	Type 1	80.5ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we276	1.29	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh MAS2-1 Cattail Mineral Shallow Marsh	39m	52	No open water	4.6ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we292	0.64	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	27m	38	Type 2	216.5ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	DFO mapping indicates the presence of American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse in Beaver Creek	None confirmed	Present
we299	1.026	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	116m	53	No open water	12.6ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay Soil	None known to be present	None confirmed	Not Present
we303	0.531	Swamp	Riverine	MAM2-2/CUT1 Reed Canary Grass Mineral Meadow Marsh with a Mineral Cultural Thicket inclusion.	13m	42	Type 2	52.8ha catchment area	Permanent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline shrubs/herbs	Riverine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Present
we304	0.526	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	20m	42	Type 1	191.3ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	Aquatic Species at Risk are not mapped within this watercourse; however, American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse are known to occur less than 2 km downstream in Beaver Creek.	None confirmed	Present
we308	0.682	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	80m	37	Type 2	461.4ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	DFO mapping indicates the presence of American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse in Beaver Creek	None confirmed	Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we309	6.018	Marsh	Riverine	MAM2-2/MAS2-1 Reed Canary Grass Mineral Meadow Marsh Complex with Cattail Mineral Shallow Marsh (mostly MAM2-2)	90m	52	Type 1	1606.9ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	DFO mapping indicates the presence of American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse in Beaver Creek	None confirmed	Present
we311	0.941	Swamp	Riverine	FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	65m	36	Type 1	1.9ha catchment area	Permanent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline trees/herbs	Riverine feature with predominantly Clay Soil	None known to be present	None confirmed	Present
we314	1.677	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	48m	63	Type 1	1132.9ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	Aquatic Species at Risk are not mapped within this watercourse; however, American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse are known to occur less than 2 km downstream in Beaver Creek.	None confirmed	Present
we320	1.336	Marsh	Riverine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	146m	36	Type 1	426.0ha catchment area	Permanent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline herbs	Riverine feature with predominantly Clay Soil	Aquatic Species at Risk are not mapped within this watercourse; however, American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse are known to occur less than 1 km downstream in Beaver Creek.	None confirmed	Present
we322	3.012	Swamp & Marsh	Palustrine	FOD9-2 with complex of SWD; MAM2-2	65m	42	No open water	4.5ha catchment area	No Surface Water Feature Present	Swamp & Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	feature with predominantly Clay Soil	None known to be present	None confirmed	Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we344	0.851	Swamp	Palustrine	SWT2-9 Grey Dogwood Mineral Thicket Swamp	50m	46	No open water	8.1ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Not mapped in soil survey	None known to be present	None confirmed	Not Present
we356	0.814	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	10m	44	No open water	9.8ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Present
we358	1.315	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	0m	34	No open water	190.0ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Present
we364	0.691	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	139m	31	No open water	249.8ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Loamy Clay Soil	None known to be present	None confirmed	Present
we365	0.597	Swamp & Marsh	Palustrine	SWT2-4 & CUT1/MAM2-2	204m	43	No open water	3014.0ha catchment area	No Surface Water Feature Present	Swamp/Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Not Present
we373	18.597	Swamp	Palustrine	SWD2-2 Green Ash Mineral Deciduous Swamp	250m	49	No open water	233.5ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	Large portion of wetland is a Deer Congregation Area (MNR)	Not Present
we376	1.721	Marsh	Palustrine	MAS2-10 - Phragmities Shallow Marsh	296m	29	No open water	4.4ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Not Present
we377	1.901	Swamp	Palustrine	SWD4-3 White-Birch Poplar Mineral Deciduous Forest	111m	46	No open water	3.0ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay Soil	None known to be present	None confirmed	Not Present
we380	0.607	Swamp	Riverine	SWD4-3 White-Birch Poplar Mineral Deciduous Forest	126m	39	Type 1	167.2ha catchment area	Permanent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline trees/herbs	Riverine feature with predominantly Silty Loam Soil	None known to be present	A portion of wetland is a Deer Congregation Area (MNR)	Present
we383	0.931	Marsh	Palustrine	MAS2-1/FOD8-1 Cattail Mineral Shallow Marsh with a Fresh-moist Poplar Deciduous Forest inclusion	411m	46	No open water	2.9ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Fine Sand Soil	None known to be present	None confirmed	Not Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we384	0.94	Marsh	Palustrine	FOD3-1/MAM2-11* Dry to Fresh Poplar Deciduous Forest with a Foxtail Mineral Meadow Marsh inclusion	371m	45	No open water	3.3ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	None confirmed	Not Present
we385	0.887	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	149m	45	No open water	2.4ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	None confirmed	Not Present
we387	0.647	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	149m	46	No open water	6.9ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	None confirmed	Not Present
we389	1.432	Swamp	Palustrine	FOD5-2/SWD3-2 Silver Maple Mineral Deciduous Swamp	919m	40	No open water	1.4ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Loamy Fine Sand Soil	None known to be present	Wetland is part of a larger Deer Congregation Area (MNR)	Not Present
we391	1.26	Marsh	Palustrine	CUM1-1/MAS2-1 Dry-Moist Old field cultural meadow with a Cattail Mineral Shallow Marsh inclusion.	426m	56	No open water	1.1ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	None confirmed	Not Present
we392	1.981	Swamp	Palustrine	SWD3-3 Swamp Maple Mineral Deciduous Swamp	1292m	57	No open water	7.6ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	Wetland is part of a larger Deer Congregation Area (MNR)	Not Present
we393	0.68	Swamp	Palustrine	SWT2-2 Willow Mineral Thicket Swamp	426m	39	No open water	40.2ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	None confirmed	Not Present
we395	0.805	Swamp	Palustrine	SWD4-3 White-Birch Poplar Mineral Deciduous Swamp	27m	39	No open water	3.2ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Loamy Sand Soil	None known to be present	None confirmed	Not Present
				SWD 2-2 Green Ash Mineral Deciduous Swamp										DFO mapping indicates the presence of Eastern		

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we396	57.32	Swamp	Palustrine	SWD4-3 White-Birch Poplar Mineral Deciduous Swamp	27m	46	No open water	602.1ha catchment area	Intermittent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Loamy Sand Soil	Eastern Pondmussel, Hickorynut, Mapleleaf and Rainbow mussel species within a watercourse draining out of Wetland 396; however, field surveys suggest absence of suitable habitat.	Wetland is part of a large Deer Congregation Area (MNR)	Present
we398	1.903	Swamp	Palustrine	FOD/SWD Deciduous Forest with a Deciduous Swamp inclusion	362m	47	No open water	143.9ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	Wetland is part of a larger Deer Congregation Area (MNR)	Not Present
we402	1.969	Swamp	Palustrine	SWD2-2 Green Ash Mineral Deciduous Swamp	7m	47	No open water	8.0ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	Large portion of wetland is a Deer Congregation Area (MNR)	Not Present
we403	12.388	Swamp	Palustrine	SWD2-2 Green Ash Mineral Deciduous Swamp	199m	42	No open water	152.3ha catchment area	Intermittent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	Large portion of wetland is a Deer Congregation Area (MNR)	Present
we404	21.468	Swamp	Palustrine	SWD2-2 Green Ash Mineral Deciduous Swamp	7m	47	No open water	26.2ha catchment area	No Surface Water Feature Present	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	Wetland is part of a large Deer Congregation Area (MNR)	Not Present
we409	9.937	Swamp	Riverine	SWD2-2 Green Ash Mineral Deciduous Swamp	181m	67	Type 1	193.2ha catchment area	Permanent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Abundance of shoreline trees/herbs	Riverine feature with predominantly Silty Clay soil	None known to be present	Significant Landbird Stopover Area	Present
we414	0.58	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	308m	35	No open water	2.7ha catchment area	No Surface Water Feature Present	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	None confirmed	Not Present

Table 5.1: Wetland Characteristics and Ecological Functions Assessment for Unevaluated Wetlands >0.5 ha found within 120m of the Project Location

Wetland #	Size (ha)	Wetland Type	Site Type	Vegetation Communities	Proximity to other (nearest) wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement (short term)	Water Quality Improvement (long term nutrient trap)	Water Quality Improvement (groundwater discharge)	Shoreline Erosion	Groundwater Recharge	Rare Species	Significant Features	Fish Habitat
OWES Manual Section		**1.1.2**	**1.1.3**	**1.2.2**	**1.2.4**	**1.2.5**	**1.2.6**	**3.1**	**3.2**	**3.2**	**3.2**	**3.4**	**3.5**	4.1.2	**4.2**	**4.2.6**
we425	1.541	Swamp	Palustrine	SWD3 Maple Mineral Swamp	36m	39	No open water	242.8ha catchment area	Intermittent	Swamp with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Silty Clay soil	None known to be present	Wetland is part of a larger Deer Congregation Area (MNR)	Present
we426	1.706	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	12m	36	No open water	958.0ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay soil	DFO mapping indicates the presence of American Eel, Grass Pickerel, Northern Brook Lamprey and River Redhorse in Beaver Creek 1.	None confirmed	Present
we434	0.54	Marsh	Palustrine	MAM2-2 Reed Canary Grass Mineral Meadow Marsh	20m	23	No open water	657.8ha catchment area	Intermittent	Marsh with <50% coverage of organic soil	No evidence of discharge (seeps) observed	Not applicable	Palustrine feature with predominantly Clay soil	None known to be present	None confirmed	Present

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	
wo1	0.13	N	N	N	N	N	N	N
wo2	0.66	N	N	N	N	N	N	N
wo3	1.52	N	N	N	N	N	N	N
wo4	0.45	N	N	N	N	N	N	N
wo5	119.96	Y	N	Y	Y	Y	N	Y
wo7	0.67	N	N	N	N	N	N	N
wo8	0.73	N	N	N	N	N	N	N
wo11	0.23	N	N	N	N	N	N	N
wo14	9.25	N	Y	Y	Y	Y	N	Y
wo15	14.14	N	Y	N	N	Y	N	Y
wo16	1.39	N	N	N	N	N	N	N
wo17	0.11	N	N	N	N	N	N	N
wo18	0.07	N	N	N	N	N	N	N
wo19	0.14	N	N	N	N	N	N	N
wo20	1.50	N	N	N	N	N	N	N
wo21	2.50	N	N	N	N	N	N	N
wo22	50.21	Y	Y	Y	N	Y	N	Y
wo23	0.09	N	N	N	N	N	N	N
wo24	3.75	N	N	N	Y	N	N	Y
wo25	12.17	N	N	N	N	Y	N	Y
wo26	0.69	N	N	N	N	N	N	N
wo27	0.84	N	N	N	N	N	N	N
wo28	0.24	N	N	N	N	N	N	N
wo29	0.06	N	N	N	N	N	N	N
wo30	0.13	N	N	N	N	N	N	N
wo31	0.15	N	N	N	N	N	N	N
wo32	0.11	N	N	N	N	N	N	N
wo33	1.27	N	N	N	N	N	N	N
wo34	1.16	N	N	N	N	N	N	N
wo35	176.13	Y	N	N	Y	Y	N	Y
wo36	14.86	N	N	N	N	Y	N	Y
wo37	0.05	N	N	N	N	N	N	N
wo38	0.71	N	N	N	N	N	N	N
wo39	3.65	N	N	N	N	N	N	N
wo40	0.07	N	N	N	N	N	N	N
wo41	0.20	N	N	N	N	N	N	N

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	
wo42	0.19	N	N	N	N	N	N	N
wo43	25.52	Y	Y	Y	Y	Y	N	Y
wo44	2.03	N	N	N	N	N	Y	Y
wo45	3.95	N	N	N	Y	N	N	Y
wo46	13.36	N	N	N	N	Y	N	Y
wo47	22.72	Y	N	N	N	Y	N	Y
wo48	1.19	N	N	N	N	N	N	N
wo49	11.68	N	N	N	Y	Y	N	Y
wo50	7.28	N	Y	N	N	Y	N	Y
wo51	0.91	N	N	N	N	N	N	N
wo52	39.83	Y	Y	N	N	Y	N	Y
wo53	0.55	N	N	N	N	N	N	N
wo54	0.08	N	N	N	N	N	N	N
wo55	13.33	N	Y	N	N	Y	N	Y
wo56	0.95	N	N	N	N	N	N	N
wo57	0.04	N	N	N	N	N	N	N
wo58	9.47	N	Y	N	Y	Y	N	Y
wo59	0.04	N	N	N	N	N	N	N
wo60	0.02	N	N	N	N	N	N	N
wo61	12.14	N	Y	N	N	Y	N	Y
wo62	92.13	Y	Y	N	Y	Y	N	Y
wo63	105.00	Y	Y	N	Y	Y	N	Y
wo64	0.04	N	N	N	N	N	N	N
wo65	0.03	N	N	N	N	N	N	N
wo66	39.74	Y	Y	N	N	Y	N	Y
wo67	86.76	Y	Y	N	Y	Y	N	Y
wo68	40.72	Y	Y	N	N	Y	N	Y
wo69	250.05	Y	Y	N	Y	Y	Y	Y
wo70	0.14	N	N	N	N	N	N	N
wo71	1.06	N	N	N	N	N	N	N
wo72	0.09	N	N	N	N	N	N	N
wo74	36.64	Y	Y	N	N	Y	N	Y
wo75	0.09	N	N	N	N	N	N	N
wo76	0.09	N	N	N	N	N	N	N
wo77	0.10	N	N	N	N	N	N	N
wo78	0.06	N	N	N	N	N	N	N

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	
wo79	0.99	N	N	N	N	N	N	N
wo80	20.97	Y	Y	N	Y	Y	Y	Y
wo81	0.19	N	N	N	N	N	N	N
wo82	27.82	Y	Y	N	N	Y	N	Y
wo83	76.37	Y	Y	Y	N	Y	N	Y
wo84	0.36	N	N	N	N	N	N	N
wo85	7.68	N	Y	N	Y	Y	N	Y
wo86	4.21	N	Y	N	N	Y	N	Y
wo87	0.36	N	N	N	N	N	N	N
wo88	41.56	Y	Y	Y	N	Y	N	Y
wo89	12.73	N	Y	N	Y	Y	N	Y
wo90	0.06	N	N	N	N	N	N	N
wo91	19.27	N	Y	N	N	Y	N	Y
wo92	2.46	N	N	N	Y	N	N	Y
wo93	1.23	N	N	N	N	N	N	N
wo94	0.11	N	N	N	N	N	N	N
wo95	0.16	N	N	N	N	N	N	N
wo96	1.32	N	N	N	N	N	N	N
wo97	53.36	Y	Y	Y	N	Y	N	Y
wo98	11.84	N	Y	Y	Y	Y	N	Y
wo99	29.01	Y	Y	N	N	Y	N	Y
wo100	11.26	N	Y	N	Y	Y	N	Y
wo101	1.75	N	N	N	N	N	N	N
wo102	27.55	N	N	N	N	Y	N	Y
wo103	3.16	N	N	N	Y	N	N	Y
wo104	31.37	Y	Y	N	Y	Y	N	Y
wo105	16.45	N	Y	N	N	Y	N	Y
wo106	10.62	N	Y	N	Y	Y	Y	Y
wo107	4.03	N	Y	N	N	Y	N	Y
wo108	80.98	Y	Y	N	Y	Y	N	Y
wo109	4.24	N	N	N	N	Y	N	Y
wo110	0.05	N	N	N	N	N	N	N
wo111	20.77	N	Y	N	Y	Y	N	Y
wo112	17.45	N	Y	N	Y	Y	Y	Y
wo113	26.79	N	Y	N	Y	Y	Y	Y
wo114	2.85	N	N	N	Y	N	N	Y

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	
wo115	21.21	Y	Y	N	N	Y	N	Y
wo116	3.78	N	N	N	N	N	N	N
wo117	1.46	N	N	N	N	N	N	N
wo118	3.00	N	N	N	N	N	N	N
wo119	6.86	N	Y	N	Y	Y	N	Y
wo120	0.09	N	N	N	N	N	N	N
wo121	29.59	Y	Y	Y	Y	Y	N	Y
wo122	2.77	N	N	N	N	N	N	N
wo123	0.57	N	N	N	N	N	N	N
wo124	4.10	N	N	N	Y	Y	N	Y
wo125	1.37	N	N	N	N	N	N	N
wo126	3.36	N	N	N	Y	N	N	Y
wo127	2.78	N	N	N	Y	N	N	Y
wo128	1.35	N	N	N	N	N	N	N
wo129	12.36	N	Y	N	N	Y	N	Y
wo130	0.52	N	N	N	N	N	N	N
wo131	0.04	N	N	N	N	N	N	N
wo132	20.73	Y	Y	N	Y	Y	N	Y
wo133	1.12	N	N	N	N	N	N	N
wo134	2.93	N	N	N	N	N	N	N
wo135	15.16	N	Y	N	Y	Y	N	Y
wo136	5.35	N	Y	N	Y	Y	N	Y
wo137	1.93	N	N	N	N	N	N	N
wo138	23.66	N	Y	N	Y	Y	Y	Y
wo139	11.11	N	Y	N	N	Y	N	Y
wo140	3.64	N	N	N	Y	N	N	Y
wo141	8.76	N	Y	N	N	Y	N	Y
wo142	84.24	Y	Y	N	N	Y	Y	Y
wo143	1.24	N	N	N	N	N	N	N
wo144	16.48	N	Y	N	N	Y	N	Y
wo145	15.15	N	Y	Y	Y	Y	N	Y
wo146	1.54	N	N	N	N	N	N	N
wo147	0.45	N	N	N	N	N	N	N
wo148	0.53	N	N	N	N	N	N	N
wo149	46.22	N	Y	Y	N	Y	N	Y
wo150	310.81	Y	Y	Y	N	Y	N	Y

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	
wo151	32.15	Y	Y	N	N	Y	N	Y
wo152	0.45	N	N	N	N	N	N	N
wo153	25.98	N	N	N	Y	Y	N	Y
wo154	21.25	N	Y	N	N	Y	N	Y
wo155	0.53	N	N	N	N	N	N	N
wo156	6.89	N	Y	N	N	Y	N	Y
wo157	0.82	N	N	N	N	N	N	N
wo158	0.02	N	N	N	N	N	N	N
wo159	0.27	N	N	N	N	N	N	N
wo160	2.14	N	N	N	Y	N	N	Y
wo161	0.38	N	N	N	N	N	N	N
wo162	1.22	N	N	N	N	N	N	N
wo163	28.48	N	Y	Y	Y	Y	N	Y
wo164	0.10	N	N	N	N	N	N	N
wo165	1.15	N	N	N	N	N	N	N
wo166	0.94	N	N	N	N	N	N	N
wo167	0.65	N	N	N	N	N	N	N
wo168	0.69	N	N	N	N	N	N	N
wo169	0.45	N	N	N	N	N	N	N
wo170	3.79	N	N	N	Y	N	N	Y
wo171	0.22	N	N	N	N	N	N	N
wo172	4.85	N	N	N	Y	Y	N	Y
wo173	2.54	N	N	N	Y	N	N	Y
wo174	0.12	N	N	N	N	N	N	N
wo175	0.60	N	N	N	N	N	N	N
wo176	5.56	N	Y	N	N	Y	N	Y
wo177	11.18	N	N	N	N	Y	N	Y
wo178	126.16	Y	Y	Y	N	Y	N	Y
wo179	31.34	N	N	N	Y	Y	N	Y
wo180	326.73	Y	N	Y	Y	Y	N	Y
wo181	0.10	N	N	N	N	N	N	N
wo182	0.95	N	N	N	N	N	N	N
wo183	116.99	Y	Y	Y	Y	Y	N	Y
wo184	46.93	Y	Y	N	N	Y	N	Y
wo185	12.57	N	Y	N	N	Y	N	Y
wo186	1.56	N	N	N	N	N	N	N

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	
wo187	0.48	N	N	N	N	N	N	N
wo188	0.67	N	N	N	N	N	N	N
wo189	0.39	N	N	N	N	N	N	N
wo190	25.57	Y	Y	N	Y	Y	N	Y
wo191	22.99	N	Y	N	Y	Y	N	Y
wo192	1.14	N	N	N	N	N	N	N
wo193	0.75	N	N	N	N	N	N	N
wo194	221.91	Y	Y	N	Y	Y	N	Y
wo195	29.14	Y	N	N	Y	Y	N	Y
wo196	9.18	N	N	N	Y	Y	N	Y
wo 198	10.96	N	Y	N	Y	N	N	Y
wo 199	62.08	Y	Y	Y	Y	Y	N	Y
wo 200	0.12	N	N	N	N	N	N	N
wo 201	0.50	N	N	N	N	N	N	N
wo 202	0.81	N	N	N	N	N	N	N
wo 203	0.46	N	N	N	N	N	N	N
wo 204	0.67	N	N	N	N	N	N	N
wo 205	0.48	N	N	N	N	N	N	N
wo 206	3.08	N	N	N	Y	N	N	Y
wo 207	0.20	N	N	N	N	N	N	N
wo 208	23.60	Y	N	N	Y	N	N	Y
wo 209	1.74	N	N	N	N	N	N	N
wo 210	0.38	N	N	N	N	N	N	N
wo 211	0.87	N	N	N	N	N	N	N
wo 212	75.33	Y	Y	Y	Y	Y	N	Y
wo 213	4.51	N	N	N	Y	N	N	Y
wo 214	3.12	N	N	N	N	N	N	N
wo 215	0.58	N	N	N	N	N	N	N
wo 216	2.22	N	N	N	Y	N	N	Y
wo 217	31.01	Y	Y	Y	Y	Y	N	Y
wo 218	8.49	N	Y	N	N	Y	Y	Y
wo 219	1.32	N	N	N	N	N	N	N
wo 220	3.04	N	N	N	Y	N	N	Y
wo 221	36.25	Y	N	N	Y	Y	N	Y
wo 222	0.27	N	N	N	N	N	N	N
wo 223	2.20	N	N	N	Y	N	N	Y

Table 5.2 Evaluation of Significance - Woodlands

Feature #	Criteria							Significant (Y/N)
	Size (ha) [1]	Interior habitat [2]	Proximity to other significant habitats [3]	Linkages [4]	Water protection [5]	Diversity [6]	Uncommon Characteristics [7]	

[1] Considered significant if ≥20 ha based on the woodland size criteria standards within the natural Heritage Assessment Guide for Renewable Energy Projects
[2] Considered significant if any interior habitat is present (i.e., woodland has ≥2 ha interior forest measured 100 m from the edge)
[3] Considered significant if located within 30 m from another natural feature or fish habitat, and ≥4 ha
[4] Considered significant if located within 120 m of two other significant features, and ≥4 ha
[5] Considered significant if located within 50 m of groundwater discharge, recharge, headwater area, watercourse or fish habitat, and ≥2 ha
[6] Considered significant if contains native, naturally occurring vegetation types, and ≥4 ha – could not be assessed without full access or nearby road access
[7] Considered significant if contains a rare (S1-S3) vegetation community, rare plant habitat, and ≥0.5

Table 5.3 Evaluation of Significance - Migratory Landbirds

Feature No.	Transect #	ELC Community Type(s)	Landbird Migratory Stopover Area Criteria		Significant (Yes/No)
			> 200 birds/day*	> 35 species with min 10 species recorded on 5 survey dates*	
mlsa1	1	SWD5-1, SWD4-5/SWD2-1	Y	Y	Y
	2	SWD3-2 and SWD5-1			
	3	SWD5-1			
mlsa2	n/a	SWD2-2 and FOD7-2	n/a	n/a	Y*
mlsa3	4	SWD2-3	N	N	Y**
mlsa4	5	SWD2-2 and FOD 7-2	N	N	Y**

Note: Both criteria must be present for a determination of significance

*Assumed significant due to lack of access to community to conduct passerine surveys

**Assumed significant pending fall passerine surveys

Table 5.4 Passerine Survey Results

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC	*mlsa1 Transect1*	*mlsa1 Transect2*	*mlsa1 Transect3*	*mlsa4*	*mlsa5*	Total
					Fall 2011 & Spring 2012	Fall 2011 & Spring 2012	Spring 2012	Spring 2012	Spring 2012	
Alder Flycatcher	Empidonax alnorum				0	1	0	0	0	1
American Bittern	Botaurus lentiginosus				0	1	0	0	0	1
American Crow	Corvus brachyrhynchos				49	37	8	25	3	122
American Goldfinch	Carduelis tristis				31	46	8	22	14	121
American Pipit	Anthus rubescens				0	1	0	0	0	1
American Redstart	Setophaga ruticilla				21	9	19	1	8	58
American Robin	Turdus migratorius				195	122	47	18	13	395
American Tree Sparrow	Spizella arborea				1	7	0	0	0	8
American Woodcock	Scolopax minor				2	0	0	0	0	2
Bald Eagle	Haliaeetus leucocephalus	S2B,S4N	SC	NAR	0	0	0	1	0	1
Baltimore Oriole	Icterus galbula				8	3	2	4	4	21
Barn Swallow	Hirundo rustica		THR	THR-NS	5	0	2	0	0	7
Bay-breasted Warbler	Setophaga castanea				1	0	2	0	0	3
Belted Kingfisher	Ceryle alcyon				2	0	0	0	1	3
Black-and-white Warbler	Mniotilta varia				4	4	0	1	0	9
Blackburnian Warbler	Setophaga fusca				4	2	4	1	5	16
Black-capped Chickadee	Poecile atricapillus				68	53	24	14	8	167
Blackpoll Warbler	Setophaga striata				14	7	1	3	0	25
Black-throated Blue Warbler	Setophaga caerulescens				3	1	3	0	3	10
Black-throated Green Warbler	Setophaga virens				9	6	5	0	1	21
Blue Jay	Cyanocitta cristata				32	53	6	9	17	117
Blue-gray Gnatcatcher	Polioptila caerulea				2	1	3	0	0	6
Blue-headed Vireo	Vireo solitarius				3	5	0	0	0	8
Blue-winged Warbler	Vermivora cyanoptera				2	0	0	0	0	2
Boreal Chickadee	Poecile hudsonica				0	0	3	0	0	3
Brown Creeper	Certhia americana				11	9	0	3	0	23
Brown Thrasher	Toxostoma rufum				0	5	0	0	0	5
Brown-headed Cowbird	Molothrus ater				91	32	24	6	2	155
Canada Goose	Branta canadensis				49	12	3	0	0	64
Canada Warbler	Cardellina canadensis		SC	THR	3	0	0	0	2	5
Cape May Warbler	Dendroica tigrina				1	1	0	0	0	2
Carolina Wren	Thyrothorus ludovicianus				1	0	0	0	0	1
Cedar Waxwing	Bombycilla cedrorum				24	3	6	0	0	33
Chestnut-sided Warbler	Setophaga pensylvanica				1	1	0	0	0	2
Chimney Swift	Chaetura pelagica		THR	THR	1	0	0	0	0	1
Chipping Sparrow	Spizella passerina				10	6	0	0	1	17
Common Goldeneye	Bucephala clangula				45	40	13	18	0	116
Common Grackle	Quiscalus quiscula				14	6	0	0	0	20

Table 5.4 Passerine Survey Results

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC	*mlsa1 Transect1*	*mlsa1 Transect2*	*mlsa1 Transect3*	*mlsa4*	*mlsa5*	Total
					Fall 2011 & Spring 2012	Fall 2011 & Spring 2012	Spring 2012	Spring 2012	Spring 2012	
Common Yellowthroat	Geothlypis trichas				16	27	12	1	0	56
Cooper's Hawk	Accipiter cooperii				3	0	0	0	1	4
Dark-eyed Junco	Junco hyemalis				13	26	2	0	0	41
Double-crested Cormorant	Phalacrocorax auritus				20	0	0	0	0	20
Downy Woodpecker	Picoides pubescens				21	17	9	7	2	56
Eastern Bluebird	Sialia sialis				0	0	1	0	0	1
Eastern Phoebe	Sayornis phoebe				2	1	0	1	4	8
Eastern Towhee	Pipilo erythrophthalmus				2	17	0	0	0	19
Eastern Wood-Pewee	Contopus virens				8	4	1	1	5	19
European Starling	Sturnus vulgaris				135	36	11	0	0	182
Field Sparrow	Spizella pusilla				0	8	0	0	0	8
Fox Sparrow	Passerella iliaca				1	0	0	0	0	1
Golden-crowned Kinglet	Regulus satrapa				15	19	0	0	0	34
Gray Catbird	Dumetella carolinensis				37	16	12	2	3	70
Gray-cheeked Thrush	Catharus minimus	S2S4B			3	2	0	0	0	5
Great Blue Heron	Ardea herodias				6	1	0	0	0	7
Great Crested Flycatcher	Myiarchus crinitus				7	4	3	4	7	25
Greater Yellowlegs	Tringa melanoleuca				1	0	0	0	0	1
Green-winged Teal	Anas crecca				0	8	0	0	0	8
Hairy Woodpecker	Picoides villosus				6	9	10	1	2	28
Hermit Thrush	Catharus guttatus				5	5	0	1	0	11
Horned Lark	Eremophila alpestris				3	1	0	0	0	4
House Wren	Troglodytes aedon				6	10	14	0	1	31
Indigo Bunting	Passerina cyanea				5	5	1	2	3	16
Killdeer	Charadrius vociferus				9	0	0	2	2	13
Least Flycatcher	Empidonax minimus				4	3	1	0	0	8
Magnolia Warbler	Setophaga magnolia				9	6	3	0	0	18
Mallard	Anas platyrhynchos				15	4	5	3	0	27
Merlin	Falco columbarius				2	0	0	0	0	2
Mourning Dove	Zenaida macroura				17	5	5	0	0	27
Mourning Warbler	Geothlypis philadelphia				1	0	0	1	0	2
Nashville Warbler	Oreothlypis ruficapilla				6	2	1	0	2	11
Northern Cardinal	Cardinalis cardinalis				13	6	14	10	4	47
Northern Flicker	Colaptes auratus				20	25	16	5	2	68
Northern Goshawk	Accipiter gentilis				0	1	0	0	0	1
Northern Harrier	Circus cyaneus				1	1	0	0	0	2
Northern Parula	Setophaga americana				2	2	0	1	0	5
Northern Pintail	Anas acuta				7	0	0	0	0	7

Table 5.4 Passerine Survey Results

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC	*mlsa1 Transect1*	*mlsa1 Transect2*	*mlsa1 Transect3*	*mlsa4*	*mlsa5*	Total
					Fall 2011 & Spring 2012	Fall 2011 & Spring 2012	Spring 2012	Spring 2012	Spring 2012	
Northern Waterthrush	Parkesia noveboracensis				4	1	1	1	0	7
Olive-sided Flycatcher	Contopus borealis				0	1	0	0	0	1
Orange-crowned Warbler	Vermivora celata				1	1	0	0	0	2
Ovenbird	Seiurus aurocapilla				6	2	3	1	5	17
Palm Warbler	Setophaga palmarum				3	3	0	0	0	6
Philidelphia Vireo	Vireo philadelphicus				2	3	0	0	0	5
Pileated Woodpecker	Dryocopus pileatus				4	4	0	1	1	10
Red-bellied Woodpecker	Melanerpes carolinus				9	4	1	1	7	22
Red-eyed Vireo	Vireo olivaceus				13	10	6	17	2	48
Red-tailed Hawk	Buteo jamaicensis				4	6	4	1	1	16
Red-winged Blackbird	Agelaius phoeniceus				637	199	10	24	0	870
Ring-billed Gull	Larus delawarensis				84	14	4	8	0	110
Rose-breasted Grosbeak	Pheucticus ludovicianus				23	9	12	5	8	57
Ruby-crowned Kinglet	Regulus calendula				8	12	2	4	0	26
Ruby-throated Hummingbird	Archilochus colubris				0	2	0	0	0	2
Rusty Blackbird	Euphagus carolinus			SC	136	74	12	71	0	293
Savannah Sparrow	Passerculus sandwichensis				0	2	2	0	0	4
Scarlet Tanager	Piranga olivacea				1	1	0	0	0	2
Sharp-shinned Hawk	Accipiter striatus				1	1	0	0	0	2
Song Sparrow	Melospiza melodia				131	67	28	8	4	238
Spotted Sandpiper	Actitis macularia				1	0	0	0	0	1
Swainson's Thrush	Catharus ustulatus				10	9	0	0	0	19
Swamp Sparrow	Melospiza georgiana				5	6	0	2	0	13
Tennessee Warbler	Oreothlypis peregrina				0	1	5	0	4	10
Tree Swallow	Tachycineta bicolor				2	7	0	0	1	10
Tufted Titmouse	Baeolophus bicolor				3	0	0	0	0	3
Turkey Vulture	Cathartes aura				2	0	1	2	5	10
Veery	Catharus fuscescens				2	0	0	1	0	3
Vesper Sparrow	Pooecetes gramineus				4	5	0	2	0	11
Warbling Vireo	Vireo gilvus				7	1	5	1	1	15
White-breasted Nuthatch	Slitta carolinensis				6	4	0	0	0	10
White-crowned Sparrow	Zonotrichia leucophrys				8	1	6	2	4	21
White-throated Sparrow	Zonotrichia albicollis				100	45	0	0	0	145
White-eyed Vireo	Vireo griseus	S2B			18	0	0	0	0	18
White-winged Crossbill	Loxia leucoptera				44	24	9	1	1	79
Willow Flycatcher	Empidonax traillii				0	3	1	1	0	5
Wilson's Phalarope	Phalaropus tricolor				2	5	1	0	0	8
Wilson's Warbler	Cardellina pusilla				1	1	0	0	1	3

Table 5.4 Passerine Survey Results

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC	*mlsa1 Transect1*	*mlsa1 Transect2*	*mlsa1 Transect3*	*mlsa4*	*mlsa5*	Total
					Fall 2011 & Spring 2012	Fall 2011 & Spring 2012	Spring 2012	Spring 2012	Spring 2012	
Winter Wren	Troglodytes hiemalis				2	4	0	0	2	8
Wood Duck	Aix sponsa				22	6	3	6	0	37
Wood Thrush	Hylocichla mustelina				14	3	5	6	2	30
Yellow Warbler	Setophaga petechia				50	41	55	9	2	157
Yellow-bellied Flycatcher	Empidonax flaviventris				0	2	0	0	0	2
Yellow-bellied Sapsucker	Sphyrapicus varius				14	3	0	1	0	18
Yellow-billed Cuckoo	Coccyzus americanus				1	0	0	0	0	1
Yellow-rumped Warbler	Setophaga coronata				20	67	2	1	0	90

Table 5.5 - Evaluation of Significance - Winter Raptors

Feature No.	ELC Community Type	Criteria			Significant (Y/N)
		One or more Short-eared Owls	At Least 10 Individuals and 2 Listed Species	Use Regularly for a Minimum of 20 Days	
wr1	AG, SWT2-9, CUT1-4, CUM1-1	Y	N	Unknown - assume Y	Y
wr2	AG, MAM2-2/SWT2-2, FOD4-1	Y	Y	Unknown - assume Y	Y
wr3	AG, FOD	Y	N	Unknown - assume Y	Y
wr4	AG, SWD1-1, SWD3-3, SWD4-1, FOD5, FOD9-2, SAF1-3, MAM2-2	Y	Y	Unknown - assume Y	Y
wr5	AG, FOD6-5/SWD2-2, SWT2-4, SWM2-2	N	N	N/A	N
wr6	FOD9-2/SWD1-2, SWD3-3, MAM2-2, CUM	N	N	N/A	N
wr7	AG, FOD6-5, MAM2-2, SWT2-2	N	N	N/A	N

Table 5.6 - Evaluation of Significance - Marsh Bird Breeding Habitat

Feature No.	ELC Community Type	Criteria			Significant (Y/N)
		5 or more nesting pairs of Sedge Wren or Marsh Wren	Breeding by 4 or more of the listed species	Breeding of Trumpeter Swans, Black Terns or Yellow Rail	
mbb1	MAS2-4/SAF1-3 CUW1-3/MAM2-6	N	N	N	N
mbb2	MAS2-4	N	N	N	N

Table 5.7 Evaluation of Significance - Amphibian Woodland Breeding Habitat

Feature No.	Turbine No. (within 120 m of Turbine Access Road)	Woodlot Criteria		Significant (Yes/No)
		2 or more specified species*	20 or more total individuals*	
ah1	T79, T80	No	No	No
ah2	T79, T80	Yes	Yes	Yes
ah3	T79, T80	Yes	Yes	Yes
ah5	T28	No	No	No
ah6	T56	No	No	No
ah9	T66, T94	Yes	Yes	Yes
ah12	T04	No	No	No
ah13	T04	No	No	No
ah14	T59	No	No	No
ah15	T60	No	No	No
ah17	T93	No	Yes	No
ah20	T81	No	No	No
ah21	T81	Yes	No	No
ah22	T81	Yes	No	No
ah27	T02	No	No	No
ah28	T53	Yes	No	No
ah29	T18	Yes	Yes	Yes
ah30	T31	Yes	No	No
ah32	T76	Yes	Yes	Yes
ah33	T01	No	Yes	No
ah34	T01, T76	Yes	Yes	Yes
ah36	T08	No	Yes	No
ah37	T32	Yes	Yes	Yes
ah38	T78	Yes	Yes	Yes
ah39	T55	No	No	No
ah41	T39	No	No	No
ah42	T74	No	No	No
ah43	T29	No	No	No
ah44	T74	No	No	No
ah45	T09, T51	Yes	Yes	Yes
ah46	T95	Yes	No	No
ah47	T37	Yes	Yes	Yes
ah48	T11, T41	No	No	No
ah49	T65	Yes	Yes	Yes
ah50	T82	No	No	No
ah51	T82	No	No	No
ah52	T82	No	No	No
ah53	T84	No	No	No
ah54	T89	No	No	No
ah56	T98	No	No	No
ah57	T62, T63	Yes	Yes	Yes
ah58	T24	No	Yes	No

Table 5.7 Evaluation of Significance - Amphibian Woodland Breeding Habitat

Feature No.	Turbine No. (within 120 m of Turbine Access Road)	Woodlot Criteria		Significant (Yes/No)
		2 or more specified species*	20 or more total individuals*	
ah59	T49	No	No	No
ah60	T20	No	No	No
ah61	T14, T16, T22, T44, T45, T47	Yes	Yes	Yes
ah62	T94	No	No	No
ah63	T56	No	No	No
ah64	T27, T57	Yes	Yes	Yes
ah65	T04	Yes	Yes	Yes
ah66	T54	Yes	Yes	Yes
ah67	T01	N/A	N/A	TBD (Yes)
ah68	T54, T38	Yes	Yes	Yes
ah69	T97	Yes	No	No
ah70	T97	Yes	Yes	Yes
ah71	T08	Yes	No	No
ah72	T78	No	No	No
ah73	T55	No	No	No
ah74	T07	Yes	Yes	Yes
ah75	T07	Yes	Yes	Yes
ah76	T91	No	No	No
ah78	T42	No	No	No
ah79	T05	Yes	Yes	Yes
ah80	T81	No	No	No
ah81	T81	No	No	No
ah82	T79, T80	No	No	No
ah87	T32	No	No	No
ah88	T32	No	No	No
ah89	T66, T94	Yes	Yes	Yes
ah90	T56	No	No	No

*Both criteria must be present for a determination of significance

Table 5.8 Evaluation of Significance - Amphibian Wetland Breeding Habitat

Feature No.	Turbine No. (within 120 m of Turbine Access Road)	Wetland Criteria			Significant (Yes/No)
		2 or more specified species*	20 or more total individuals*	Bullfrog Present**	
ah4	T88	No	No	No	No
ah7	T57	No	No	No	No
ah8	T57	No	No	No	No
ah11	T04	No	No	No	No
ah16	T06	No	No	No	No
ah18	T06	No	No	No	No
ah23	T06	No	No	No	No
ah24	T06	Yes	No	No	No
ah25	T52, T53	No	No	Yes	Yes
ah31	T33	No	Yes	No	No
ah35	T38	Yes	Yes	No	Yes
ah40	T32	No	No	No	No
ah55	T84	Yes	No	Yes	Yes
ah77	T19	Yes	No	No	No
ah83	T01	Yes	Yes	No	Yes
ah84	T09, T51	No	No	No	No
ah85	T95	No	No	No	No
ah91	T18	No	No	No	No

*Both criteria must be present for a determination of significance
**If a Bullfrog is identified in a wetland feature, the feature is automatically determined significant regardless of other species and counts.

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah1-1	April 21, 2012								No calls
	May 24, 2012								No calls
	June 28, 2012								GRTR*
ah2-1	April 21, 2012								SPPE 1*, CHFR 1*
	May 24, 2012								No calls
	June 28, 2012								No calls
ah2-2	April 30, 2012		1-1, 1-1, 1-1						
	May 24, 2012							1-1	
	June 28, 2012								No calls
ah2-3	April 21, 2012		1-10	1-7					SPPE 1*, CHFR 1*
	May 24, 2012								No calls
	June 28, 2012								No calls
ah3-1	April 21, 2012		1-20						
	May 24, 2012							1-5	
	June 28, 2012								No calls
ah4-1	April 8, 2012								No calls
	May 27, 2012								No calls
	June 18, 2012								No calls
ah5-1	April 7, 2012								No calls
	May 15, 2012							1-3	GRTR 1-2*
	June 25, 2012								GRFR*
ah6-1									
	May 24, 2012				1-1, 1-2				GRTR 2*
	June 28, 2012								No calls
ah7-1	April 18, 2012								No calls
	May 22, 2012								No calls
	June 22, 2012								No calls
ah8-1	April 18, 2012								SPPE 1*
	May 22, 2012								No calls
	June 22, 2012								No calls
ah9-1									
	May 26, 2012								CHFR 1-5*
	June 26, 2012								No calls
ah9-2	April 12, 2012								SPPE 3*
	May 26, 2012					1-1		1-1	
	June 26, 2012								No calls
ah9-3	April 12, 2012		1-4, 3-150						SPPE*
	May 26, 2012							1-3	GRTR*
	June 26, 2012								No calls
	April 12, 2012								No calls

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah9-4	May 26, 2012					1-1, 1-1			
	June 26, 2012								No calls
ah9-5	April 12, 2012		3-80						SPPE*
	May 26, 2012					1-1		1-10	GRTR*
	June 26, 2012								No calls
ah11-1	April 18, 2012				1-1				
	May 17, 2012								GRFR 1-1*, BULL3-1*
	June 27, 2012								No calls
ah12-1	April 18, 2012								No calls
	May 17, 2012					1-1			
	June 27, 2012								No calls
ah13-1	April 18, 2012								SPPE*, CHFR*
	May 17, 2012								No calls
	June 27, 2012								No calls
ah14-1	April 12, 2012								No calls
	May 17, 2012								No calls
	June 27, 2012								No calls
ah15-1									
	May 17, 2012								No calls
	June 27, 2012								No calls
ah16-1	April 21, 2012				1-1				
	May 15, 2012								SPPE 1-2*, GRTR 2-5*
	June 25, 2012								No calls
ah17-1	April 9, 2012								No calls
	May 27, 2012					1-10		3-100	GRTR*, GRFR
	June 26, 2012								NLFR*
ah18-1	April 21, 2012		1-5	1-2					
	May 15, 2012								CHFR 1-1*, GRTR 1-2*
	June 25, 2012								No calls
ah20-1	April 30, 2012			1-1					SPPE 1*, CHFR 1*
	May 30, 2012								GRFR*
	June 18, 2012								No calls
ah21-1	April 30, 2012		2	1					
	May 30, 2012					1-3			BULL*, WOFR*
	June 18, 2012								No calls
ah22-1	April 30, 2012		2	1, 2					
	May 30, 2012								No calls
	June 18, 2012								GRTR*
ah23-1	April 21, 2012			1-1					
	May 15, 2012								CHFR 1-1*, GRTR 1-3*

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
	June 25, 2012								No calls
ah24-1	April 21, 2012			1-3	1-1, 1-1				
	May 15, 2012			1-3		1-2		1-1, 1-2	SPEE 1-2*, GRTR 2-5*
	June 25, 2012								No calls
ah25-1	April 18, 2012								No calls
	May 24, 2012								No calls
	June 21, 2012						1-1		
ah27-1	April 8, 2012								No calls
	May 22, 2012								No calls
	June 22, 2012	1-3, 1-1							NLFR*
ah28-1	April 18, 2012		1-10	1-3					SPPE*
	May 24, 2012								No calls
	June 21, 2012								No calls
ah29-1	April 27, 2012								No calls
	May 17, 2012								SPPE 1-1*
	June 27, 2012								No Calls
ah29-2									Not Surveyed
	May 17, 2012								SPPE 1-1*
	June 27, 2012					1-1, 1-1			
ah29-3	April 27, 2012		3-200	2-30					CHFR*, SPPE*
	June 27, 2012								No calls
ah30-1	April 12, 2012		1-1						
	May 15, 2012								No calls
	June 25, 2012								No calls
ah30-2	April 12, 2012								No calls
	May 15, 2012							1-2, 1-2	GRTR 1-4*
	June 25, 2012								No calls
ah31-1	April 8, 2012		3-100						SPPE*
	May 22, 2012							2-50	GRTR*
	June 22, 2012								No calls
ah32-1	April 27, 2012		3-100	1-10					SPPE*
	May 23, 2012					1-1, 1-2, 1-2, 1-3			GRTR*
	June 14, 2012								GRTR*
ah32-2	April 27, 2012		1-1	1-10	1-1				
	May 23, 2012								No calls
	June 14, 2012								GRTR*
ah33-1	April 27, 2012			3-50					SPPE3*, CHFR2*
	May 23, 2012								No calls
	June 14, 2012								No calls

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah33-2									
	May 23, 2012								No calls
	June 14, 2012								*GRTR
ah34-1	April 27, 2012			2-20	1-2				
	May 23, 2012							1-2, 1-3, 1-3	
	June 14, 2012								No calls
ah35-1	April 22, 2012								No calls
	May 9, 2012		2-5, 2-8	1-5, 1-5, 2-5	2-5			1-1	GRTR*
	June 11, 2012					1-1			
ah36-1	April 18, 2012		2-30						SPPE 2*
	May 24, 2012								AMTO 1-1, 1-2*
	June 25, 2012								GRFR*
ah37-1	April 27, 2012	1-1		3-80	1-1				CHFR*
	May 23, 2012								No calls
	June 14, 2012								GRTR*, GRFR*
ah37-2	April 27, 2012			1-1	1-1				AMTO 1*, CHFR*
	May 23, 2012			1-1		1-1, 1-1, 1-1, 1-2		1-1, 1-2	
	June 14, 2012								GRTR*, GRFR*
ah38-1	April 22, 2012		2-50	1-3					SPPE 2*, CHFR 1*
	May 22, 2012					1-5		3-100	GRTR*, GRFR*
	June 22, 2012								BULL*
ah39-1	April 27, 2012				1-1				AMTO 1*
	May 23, 2012								GRTR 1-1, 1-3*
	June 14, 2012								GRTR*
ah40-1	April 27, 2012								No calls
	May 23, 2012								No calls
	June 14, 2012								GRTR*
ah41-1	April 7, 2012		1-1						SPPE*
	May 23, 2012								No calls
	June 21, 2012								No calls
ah42-1									
	May 23, 2012								GRTR*, GRFR*
	June 12, 2012								GRTR*
ah43-1	April 22, 2012		1-10						SPPE 1*
	May 30, 2012								CHFR 1-1*
	June 18, 2012								No calls
ah44-1									
	May 23, 2012								GRTR*
	June 12, 2012								GRTR*, GRFR

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah45-1	April 7, 2012		1-3, 2-20						SPPE*
	May 30, 2012								No calls
	June 21, 2012								No calls
ah45-2	April 7, 2012		3-60	1-2					SPPE*
	May 30, 2012								BULL*
	June 21, 2012								No calls
ah46-1	April 29, 2012		1-3, 2-6	1-2					
	May 23, 2012								No calls
	June 12, 2012								GRFR*, GRTR*
ah47-1									
	May 23, 2012					1-8		3-100+	BULL 2-10*
	June 12, 2012					1-1	1-4	1-2	
ah47-2	April 17, 2012								No calls
	May 23, 2012					1-1, 1-2, 1-3	1-2, 1-2	3-30	GRTR 3*
	June 12, 2012					1-1, 1-3	1-3, 1-4	1-1, 1-2	
ah47-3	April 17, 2012		2-15						SPPE 2*
	May 23, 2012								GRTR 2-10, 2-10*
	June 12, 2012								No calls
ah48-1	April 9, 2012								No calls
	May 17, 2012								No calls
	June 14, 2012								No calls
ah48-2	April 9, 2012								No calls
	May 17, 2012								No calls
	June 14, 2012							1-1	GRTR*
ah49-1	April 8, 2012		1-5	1-5					
	May 14, 2012		1-1		1-1	1-1	1-1	1-5, 2-10	GRTR 1-1*
	June 19, 2012								*GRFR
ah50-1									
	May 23, 2012								No calls
	June 13, 2012								No calls
ah51-2									
	May 23, 2012								No calls
	June 13, 2012					1-3			
ah52-1									
	May 23, 2012								No calls
	June 13, 2012								GRFR*, BULL*
ah53-1									
	May 14, 2012					1-1	1-2		GRTR*
	June 19, 2012					1-3			

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah53-2	May 14, 2012								No calls
	June 19, 2012							1-1	GRTR*
ah53-3									
	May 14, 2012								No calls
	June 19, 2012							1-1	
ah54-1									
	May 14, 2012								GRTR 2-10*, SPPE 2-4*, GRFR*
	June 19, 2012								No calls
ah55-1									
	May 14, 2012					1-1	1-2		GRTR 1-5*, GRFR 1-1*
	June 19, 2012					1-1	1-1		*GRTR
ah56-1									
	May 17, 2012								No calls
	June 13, 2012								No calls
ah57-1	April 29, 2012		1-1, 1-1, 2-5	1-2					
	May 22, 2012								No calls
	June 11, 2012					1-3		1-5	
ah57-2	April 29, 2012		1-2, 2-5, 2-10	1-1, 1-2					SPPE*
	May 22, 2012				1-1	1-1, 1-1, 1-2			GRFR*
	June 11, 2012								No calls
ah57-3	April 20, 2012								No calls
	May 22, 2012								No calls
	June 11, 2012								*AMTO
ah57-4	April 20, 2012								No calls
	May 22, 2012								No calls
	June 11, 2012								*AMTO
ah57-5	April 20, 2012		3-50	2-20					SPPE 3*, CHFR 2*
	May 22, 2012								GRFR 1-1*
	June 11, 2012								No calls
ah58-1	April 20, 2012		3-60						*GRFR
	May 14, 2012								*AMTO, *GRFR
	June 19, 2012					1-1			*GRFR
ah59-1									
	May 23, 2012				1-1				
	June 13, 2012								No calls
ah59-2									
	May 23, 2012								No calls
	June 13, 2012								No calls
	April 20, 2012								No calls

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah60-1	May 30, 2012								No calls
	June 14, 2012								No calls
ah61-1	April 25, 2012		1-10, 3-500						SPPE 3*
	May 24, 2012					1-10	1-1		GRGR*
	June 8, 2012								No calls
ah61-2	April 25, 2012		3-300						SPPE 3*
	May 24, 2012					2-11	1-2		GRFR*, BULL*
	June 8, 2012								No calls
ah61-3	April 25, 2012		3-500	2-40					SPPE 3*, CHFR 2*
	May 24, 2012					2-15, 3-30	1-4		GRFR*, BULL*
	June 8, 2012					1-5			BULL*
ah61-4	April 25, 2012		3-300	2-20					SPPE 3*, CHFR 2*
	May 24, 2012								No Calls
	June 8, 2012					1-1, 1-1, 1-2			
ah61-5	April 25, 2012		3-100	1-5					SPPE 3*, CHFR 1*
	May 24, 2012					2-15			GRFR*
	June 8, 2012								No calls
ah61-6	April 25, 2012		3-500	2-20					SPPE 3*, CHFR 2*
	May 24, 2012								GRFR 1-3*
ah61-7	April 25, 2012		3-500	2-25					
	May 24, 2012								BULL 1-1*
	June 8, 2012								No calls
ah61-8	April 25, 2012		3-500	2-20					
	May 24, 2012					1-2	1-1		GRFR 1-1*
	June 8, 2012				1-1	1-1			
ah62-1									
	May 26, 2012								No calls
	June 26, 2012								No calls
ah63-1									
	May 24, 2012					1-1, 1-4			GRTR*
	June 28, 2012								No calls
ah64-1									
	May 22, 2012					1-10, 2-15	1-8	3-100	BULL*, GRTR*, GRFR*
	June 22, 2012								NLFR*
ah64-2	April 7, 2012		1-1, 3-75	1-1, 1-1, 1-2					
	May 15, 2012					1-1		2-5, 2-5, 2-5	GRTR*
	June 25, 2012								No calls
	April 18, 2012		3-3	1-5					SPPE*

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah65-1	May 17, 2012					1-1, 1-1	1-1, 2-1, 3-1		BULL*
	June 27, 2012								No calls
ah66-1	April 7, 2012		1-5						SPPE 3*
	May 9, 2012		1-4, 2-10	2-15	1-1				GRTR 1-1*
	June 11, 2012								No calls
ah67-1									Not surveyed
									Not surveyed
									Not surveyed
ah68-1	April 7, 2012		1-1, 1-3, 3-50	1-2, 1-3					
	May 9, 2012	1-2	1-1, 2-5, 2-10					1-1	GRTR 2-7*, SPPE*
	June 11, 2012								No calls
ah68-2	April 22, 2012								No calls
	May 9, 2012		1-1, 1-2, 1-3, 1-7		1-1			1-2	
	June 11, 2012								No calls
ah69-1	April 29, 2012		1-2	1-1					SPPE*, AMTO 1*
	May 26, 2012								No calls
	June 18, 2012								GRTR*
ah70-1	April 29, 2012		1-3, 1-4,	1-1	1-1				
	May 26, 2012					1-5			
	June 18, 2012					1-1, 1-2, 1-2	1-1, 1-1		
ah71-1	April 18, 2012		1-10						SPPE 1*
	May 24, 2012				1-1			1-1	AMTO 1-1*, GRFR 1-1* GRTR*
	June 25, 2012								No calls
ah72-1	April 22, 2012								No calls
	May 22, 2012								GRTR 2-25*
	June 22, 2012								No calls
ah73-1	April 27, 2012			1-10					
	May 23, 2012								No calls
	June 14, 2012								No calls
ah74-1	April 22, 2012								No calls
	May 9, 2012		1-2, 2-8	1-3, 2-10	1-1			1-1, 1-1	CHFR 1-4*
	June 11, 2012								No calls
ah75-1	April 22, 2012		3-100						SPPE 3*
	May 9, 2012		1-4, 2-5	1-1	1-1				GRTR 1-2*
	June 11, 2012								No calls
ah76-1	April 9, 2012								SPPE*, CHFR*
	May 17, 2012								No calls
	June 14, 2012								No calls
	April 8, 2012								No calls

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah77-1	May 14, 2012								No calls
	June 22, 2012	1-3				1-3, 1-3			GRFR*
ah78-1	April 20, 2012		3-20						SPPE 3*
	May 23, 2012								No calls
	June 13, 2012								No calls
ah79-1	April 30, 2012		3-70	2-15					SPPE*, CHFR*
	May 30, 2012								No calls
	June 14, 2012							1-3	GRTR*
ah80-1	April 30, 2012			2					
	May 30, 2012								No calls
	June 18, 2012								No calls
ah81-1	April 30, 2012		1-1						SPPE 2*, CHFR 2*
	June 18, 2012								No calls
ah82-1	April 30, 2012								No calls
	May 24, 2012					1-2		1-1, 1-4	
	June 28, 2012								No calls
ah83-1	April 27, 2012		1-5	3-50	1-1				
	May 23, 2012								BULL*, GRFR*
	June 14, 2012								BULL*, GRFR*
ah84-1	April 7, 2012								No Calls
	May 30, 2012					1-7			BULL*
	June 21, 2012								GRFR*, BULL*
ah85-1	April 29, 2012								No calls
	May 23, 2012					1-1, 1-1, 1-1			GRTR 1-7*, GRFR 1-1, 1-2*
	June 12, 2012					2-10			
ah87-1	April 27, 2012								No calls
	May 23, 2012								No calls
	June 14, 2012								No calls
ah88-1	April 27, 2012								No calls
	May 23, 2012							1-1, 1-1	
	June 14, 2012								No calls
ah89-1	April 12, 2012		2-30	1-1					SPPE 3*
	May 26, 2012					1-3		3-40	GRTR*
	June 26, 2012								No calls
ah90-1									
	May 24, 2012					1-1			
	June 28, 2012								No calls
	April 27, 2012								No calls

Table 5.9 Amphibian Call Counts

STATION	DATE	SPECIES							NOTES
		NLFR	SPPE	CHFR	AMTO	GRFR	BULL	GRTR	
ah91-1	May 17, 2012								No calls
	June 27, 2012								No calls

* Represents calls heard outside of the 100-meter station area
Call count codes: (1) calls not simultaneous – number of individuals can be accurately counted; number (2) some calls simultaneous – number of individuals can be

NLFR	Northern Leopard Frog (*Rana pipiens*)
WOFR	Wood Frog (*Rana sylvatica*)
SPPE	Spring Peeper (*Pseudacris crucifer*)
CHFR	Chorus Frog (*Pseudacris triseriata*)
AMTO	American Toad (*Bufo americanus*)

Table 5.10 Breeding Bird Point Count Results

MAXIMUM NUMBER OF INDIVIDUALS PER POINT COUNT LOCATION		MBB1	MBB2	SSBB1	SSBB2	MAX TOTALS	AVG/PC	Density/10ha
COMMON NAME	***SCIENTIFIC NAME***	Marsh	Marsh	Shrub	Shrub			
Ring-billed Gull	*Larus delawarensis*	20	0	0	0	20	1.05	3.35
American Robin	*Turdus migratorius*	8	1	2	2	13	0.68	2.18
Song Sparrow	*Melospiza melodia*	4	2	2	2	10	0.53	1.68
Red-winged Blackbird	*Agelaius phoeniceus*	5	1	1	1	8	0.42	1.34
American Goldfinch	*Carduelis tristis*	0	2	1	3	6	0.32	1.01
Gray Catbird	*Dumetella carolinensis*	4	1	1	0	6	0.32	1.01
Common Yellowthroat	*Geothlypis trichas*	1	1	0	0	2	0.11	0.34
Yellow Warbler	*Dendroica petechia*	2	1	0	0	3	0.16	0.50
Brown-headed Cowbird	*Molothrus ater*	0	1	1	1	3	0.16	0.50
Great Crested Flycatcher	*Myiarchus crinitus*	0	2	1	1	4	0.21	0.67
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	0	1	0	1	2	0.11	0.34
Blue Jay	*Cyanocitta cristata*	0	1	1	0	2	0.11	0.34
Baltimore Oriole	*Icterus galbula*	1	0	0	0	1	0.05	0.17
Northern Cardinal	*Cardinalis cardinalis*	0	0	0	1	1	0.05	0.17
Downy Woodpecker	*Picoides pubescens*	0	0	1	0	1	0.05	0.17
Red-eyed Vireo	*Vireo olivaceus*	0	0	0	0	0	0.00	0.00
Eastern Towhee	*Pipilo erythrophthalmus*	0	0	0	2	2	0.11	0.34
Mourning Dove	*Zenaida macroura*	0	0	1	0	1	0.05	0.17
Willow Flycatcher	*Empidonax traillii*	0	1	0	0	1	0.05	0.17
Great Blue Heron	*Ardea herodias*	0	0	0	1	1	0.05	0.17
Northern Flicker	*Colaptes auratus*	0	0	0	0	0	0.00	0.00
Eastern Wood-Pewee	*Contopus virens*	0	0	1	0	1	0.05	0.17
Warbling Vireo	*Vireo gilvus*	1	0	0	0	1	0.05	0.17
Black-capped Chickadee	*Poecile atricapilla*	0	0	1	0	1	0.05	0.17
White-breasted Nuthatch	*Sitta carolinensis*	0	0	0	0	0	0.00	0.00
Veery	*Catharus fuscescens*	1	0	0	0	1	0.05	0.17
Wood Thrush	*Hylocichla mustelina*	0	0	0	0	0	0.00	0.00
Chipping Sparrow	*Spizella passerina*	0	0	1	0	1	0.05	0.17
Field Sparrow	*Spizella pusilla*	0	0	0	1	1	0.05	0.17

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
Wetlands						
All wetlands within 120m of Project Location.	Degradation of wetland through changes in water flow or surface water contamination.	Prevent contamination through surface flow during construction and spills.	All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from wetlands.	Culvert locations.	Construction Supervisor to regularly visually monitor culvert installations to ensure flow conveyance, with no restrictions or ponding.	Keep emergency spill kits on site.
		Maintain existing surface water flow patterns.	Maintain surface flow patterns to wetlands by installing properly designed and sited culverts under access roads or in other areas, as required.			Implement MOE spill action plan if necessary.
						Dispose of waste material by authorized and approved offsite vendors.
	Wetland desiccation or drying resulting from removal of riparian or	Minimize removal of riparian and buffering vegetation.	Implement Vegetation Removal measures (see Section 6.3.1.1).	Ensure that seed establishes in areas of disturbance within one	Once after seeding area.	Reseed areas where seed does not become adequately establish to ensure stabilizing vegetative cover establishes within the growing season.
			Re-vegetate disturbed areas with fast growing native species as soon as practical after construction activity within the disturbed areas is completed.		Once in late spring the year following seeding.	
						In the event of event of accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species.
	Degradation of wetland through sedimentation.	Prevent contamination by sediment and erosion.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	All E&S control measures checked when inclement weather events anticipated (i.e., high winds, rain events).	Sediment will be removed if it is found to accumulate.
					All E&S control measures to be regularly monitored by Construction Supervisor to ensure they are functioning as intended.	If siltation of surface water is identified, the source of siltation will be isolated, contained, and controlled and sediment control measures increased as required to prevent additional sedimentation.
						Erosion control measures will remain in place until disturbed soils have stabilized.
			Stockpile materials >30m from wetland edge. Where this is not possible stockpiles will be covered when not in use, especially during rain events or high wind events.	All stockpiles within 30m of wetlands (if applicable).	All covers on stockpiles to be put in place and checked when inclement weather events anticipated (i.e., high winds, rain events).	Sediment will be removed if it is found to accumulate.
					Stockpiles to be regularly monitored by Construction Supervisor and any deficiencies will be rectified as soon as practicable.	If covers over stockpile are found not to be effectively preventing sediment transport, additional E&S control measures employed as necessary.
	Degradation of wetland during Horizontal Directional Drilling Frac-out.	Prevent/minimize contamination by implementing a Frac-out Response Plan immediately if a Frac-out occurs during Horizontal Directional Drilling.	Keep emergency spills equipment close by in case Frac-out occurs.	Check for evidence of Frac-out during Horizontal Directional Drilling.	During Horizontal Directional Drilling.	Implement Frac-out Response Plan as follows:
			Implement Frac-out Response Plan immediately if Frac-out occurs.			Isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud.

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
						Consult with MOE regarding next appropriate action
				At the site of revegetation after a Frac-out incident.	Twice per year for 2 years.	Once excess drilling mud is removed, the area will be seeded and/or replanted using native species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.
						Monitor re-vegetated areas twice per year for two years subsequent to frac-out to confirm re-vegetation is successful. If re-vegetation is unsuccessful, additional measures will be taken to restore the vegetation, including removal and replacement (using local soils) of existing substrate in the affected area.
Woodlands						
Significant Woodlands	Accidental damage to critical root zones AND accidental loss of trees or damage to limbs.	Prevent damage to the critical root zones AND prevent accidental loss of trees or damage to limbs.	Clearly delineate work area using a barrier such as a silt fence to avoid accidental encroachment on the feature that would lead to damage of trees and root zones.	Check silt fencing along the periphery of significant woodlands.	Daily when construction activities occur within the immediate vicinity of significant woodlands and when inclement weather is anticipated (i.e. rain events).	Any tree limbs or root zones that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques. A certified arborist will evaluate tree health one year later.
			Workers will be advised not to trespass beyond the boundary of the marked area.			Pruning will be avoided during leaf fall (Sep-Nov) and not during the breeding season for migratory birds (May 1 - July 31) unless presence/absence surveys are conducted by a qualified biologist. If a nest is found, a buffer will be implemented to protect the nest while it is active.
			All construction vehicles and personnel must stay within the construction envelope.			
			Erect silt fencing as far away as possible from the significant woodland and no closer than the dripline to prevent sedimentation within critical root zones.	Check silt fencing along the periphery of feature significant woodlands to make sure it is fully functional.	Daily when construction activities occur within the immediate vicinity of significant woodlands and when inclement weather is anticipated (i.e. rain events).	Any build up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment.
			Implement Sediment and Erosion control measures (see Section 6.3.1.2).			Repair silt fencing immediately if not functional.
			Any issues will be resolved in a timely fashion.			
			Stockpile materials >30m from woodland edge. Where this is not possible stockpiles will be covered when not in use, especially during rain events or high wind events.	All stockpiles within 30m of significant woodlands (if applicable).	All covers on stockpiles to be put in place and checked when inclement weather events anticipated (i.e. high winds, rain events).	Not required.
			Re-vegetate disturbed areas with fast growing native species as soon as construction activity within the disturbed areas is complete.	Check that seed grows in areas of disturbance within one growing season.	Once after seeding area.	Replant areas where seed does not grow to ensure vegetation establishes within the growing season.

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
			All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from significant woodlands.	Not required.	Not required.	Keep emergency spill kits on site. Implement MOE spill action plan if necessary. Dispose of waste material by authorized and approved offsite vendors.
			Implement infiltration (i.e. minimize paved surfaces and design roads to promote infiltration) techniques to the maximum extent possible to avoid changes in soil moisture and compaction.	Not required.	Not required.	Not required.
	Degradation of woodland during Horizontal Directional Drilling	Prevent/minimize degradation of woodland during Horizontal Directional Drilling	Implement mitigation measures as follows: No clearing of vegetation to occur for drilling. Drilling equipment will be set up and drilling will be conducted a minimum of 30 m from the edge of the woodland. Drilling will occur at a depth of 3 m (or as close to this depth as the site allows). Sedimentation control fencing to be installed prior to drilling. Topsoil stripped from the drill exit site must be stockpiled in a location designated by the inspector and as far as possible from the feature. Any required dewatering associated with this process will follow the mitigation measures outlined in section 6.3.1.3. Check construction machinery for presence of wildlife prior to operating machinery.	Check silt fencing along the periphery of the feature.	During Horizontal Directional Drilling.	Any build up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment. Repair silt fencing immediately if not functional.
	Degradation of woodland during Horizontal Directional Drilling Frac-out.	Prevent/minimize contamination by implementing a Frac-out Response Plan immediately if a Frac-out occurs during Horizontal Directional Drilling.	Keep emergency spills equipment close by in case Frac-out occurs. Implement Frac-out Response Plan immediately if Frac-out occurs.	Check for evidence of Frac-out during Horizontal Directional Drilling.	During Horizontal Directional Drilling.	Implement Frac-out Response Plan as follows: Isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud. Consult with MOE regarding next appropriate action
				At the site of revegetation after a Frac-out incident.	Twice per year for 2 years.	Once excess drilling mud is removed, the area will be seeded and/or replanted using native species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
						Monitor re-vegetated areas twice per year for two years subsequent to frac-out to confirm re-vegetation is successful. If re-vegetation is unsuccessful, additional measures will be taken to restore the vegetation, including removal and replacement (using local soils) of existing substrate in the affected area.
	Disturbances to Wildlife	Limit light/noise disturbances to wildlife.	Construction activities within 30m of significant woodlands will occur during daylight hours to avoid excessive noise and light disturbance.	Not required.	Not required.	Not required.
Wildlife Habitat Seasonal Concentration Areas						
Landbird Migratory Bird Area (mlsa1-mlsa4)	Habitat removal.	Minimize the removal of habitat.	Implement Vegetation Removal measures (see Section 6.3.1.1).	In and around the staked boundary of the habitat to be cleared.	During vegetation removal activities.	If clearing of vegetation occurs beyond defined limits, the area should be rehabilitated to pre-disturbance conditions.
	Degredation of habitat through erosion and sedimentation.	Prevent contamination by sediment and erosion.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	Daily when construction activities occur within the immediate vicinity of feature landbird migratory bird areas and when inclement weather is anticipated (i.e. rain events).	Any build up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment.
			Erosion control measures will remain in place until disturbed soils have stabilized.			Sediment will be removed if it is found to accumulate.
	During construction, there will be the potential for accidental spills.	Prevent contamination from accidental spills.	All refuelling activities should >30m from Landbird Migratory Areas.	Not required.	Not required.	Keep emergency spill kits on site.
			In case of accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.			Implement MOE spill action plan if necessary.
			Any fuel storage and activities with the potential for contamination should occur in properly protected and sealed areas.			Dispose of waste material by authorized and approved offsite vendors.
	Shifts in species abundance, avoidance and behaviour during construction activities.	Minimize disturbance during construction, especially during sensitive breeding periods (May 1-July 31).	Construction activities will take place during August-November 2013, outside of the breeding season.	Not required.	Not required.	Not required.
	Shifts in species abundance, avoidance and behaviour during wind farm operation.	Monitor potential impacts of wind farm operation.	Monitor bird mortality according to Section 6.3.6.2.	Bird mortality monitoring at 23 Turbine Locations.	Mortality monitoring for birds will be conducted twice weekly (3-4 day intervals) at ten turbines from May 1 - October 31 for 3 years post construction (see Section 6.3.6.2).	The Environmental Effects Monitoring Plan also identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met.
			Monitor disturbance according to Section 6.3.6.2.		3 years post construction.	

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
					Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation. If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed	
	Impacts of turbine lighting on migratory birds.	Turbine lighting must conform to Transport Canada standards.	Lights with the shortest allowable flash durations and the longest allowable pause between flashes are preferred. To the extent possible, no steady burning lights/floodlights will be used at the facility.	Not required.		Not required.
Winter Raptor Areas - Short-eared Owl (wr1, wr2, wr4, wr5)	Habitat removal.	Minimize the removal of habitat.	Implement Vegetation Removal measures (see Section 6.3.1.1).	In and around the staked boundary of the habitat to be cleared.	If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed	If clearing of vegetation occurs beyond defined limits, the area will be rehabilitated to pre-disturbance conditions.
	Degredation of habitat through erosion and sedimentation.	Prevent contamination by sediment and erosion.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	Check silt fencing along the periphery of feature deer congregational areas to make sure it is fully functional.	Daily when construction activities occur within the immediate vicinity of feature deer congregational areas and when inclement weather is anticipated (i.e. rain events).	Any build up of sediment beyond the silt fence will be cleaned up and removed to avoid risk of further spread of sediment.
	During construction, there will be the potential for accidental spills.	Prevent contamination from accidental spills.	All refuelling activities should occur outside of Winter Raptor Areas.	Not required.	Not required.	Keep emergency spill kits on site.
			In case of accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately.			Implement MOE spill action plan if necessary.
			Any fuel storage and activities with the potential for contamination should occur in properly protected and sealed areas.			Dispose of waste material by authorized and approved offsite vendors.
	Shifts in species abundance, avoidance and behaviour during wind farm operation.	Monitor potential impacts of wind farm operation.	Monitor for raptors according to Section 6.6.2	Raptor monitoring at 23 Turbine Locations.	Raptor monitoring will be conducted weekly from November 1 - April 30 for 3 years post construction (see Section 6.3.6.3).	An Environmental Effects Monitoring Plan identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance
			Monitor disturbance according to Section 6.6.2		3 years post construction.	

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
Bat Maternity Colonies - Small-footed Bat and Eastern Pipistrelle (bmc1, bmc3, bmc6, bmc7-16, bmc20, bmc23-39, bmc42-55)	Habitat removal.	Minimize the removal of habitat.	Implement Vegetation Removal measures (see Section 6.3.1.1).	In and around the staked boundary of the habitat to be cleared.	During vegetation removal activities.	If clearing of vegetation occurs beyond defined limits, the area should be rehabilitated to pre-disturbance conditions.
	Shifts in species abundance, avoidance and behaviour during wind farm operation.	Monitor potential impacts of wind farm operation.	Monitor for bat mortality according to Section 6.6.3	Bat monitoring at 23 Turbine Locations	Bat monitoring will be conducted twice weekly (3-4 day intervals) mortality monitoring of birds and bats at 30% (23 of 77) of the wind turbines from May 1 to October 31. Searcher efficiency and scavenger trials will be conducted each year according to current guidance documents.	An Environmental Effects Monitoring Plan identifies performance objectives to assess the effectiveness of the proposed mitigation measures and describes a response and contingency plan that will be implemented if performance objectives cannot be met.
			Monitor disturbance according to Section 6.6.3		3 years post construction.	
					Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation. If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed	
Turtle Overwintering Areas (twa1)	Habitat removal.	Minimize the removal of habitat.	Implement Vegetation Removal measures (see Section 6.3.1.1).	In and around the staked boundary of the habitat to be cleared.	During vegetation removal activities.	If clearing of vegetation occurs beyond defined limits, the area should be rehabilitated to pre-disturbance conditions.
	Habitat avoidance, disturbance and mortality from construction activities.	Minimize disturbance, especially during sensitive periods when turtles are emerging from their overwintering habitat to nest (Apr/May)	Construction in the vicinity of turtle nesting habitat should avoid sensitive periods to the extent reasonably possible.	Not required.	Not required.	Not required.
		Prevent vehicle strikes, especially during sensitive periods.	Restrict vehicle traffic to daytime hours, and limit speeds to 30 km or less on roads near turtle nesting habitat (including signage) during sensitive periods.			
Snake Hibernacula - Milksnake and Eastern Ribbonsnake (sh2, sha3, sh4, sh6, sh7)	Habitat avoidance, disturbance and mortality from construction activities.	Minimize disturbance, especially during sensitive periods when snakes are emerging from (Apr/May), or entering (Sept/Oct) hibernacula.	Construction in the vicinity of snake hibernacula should avoid sensitive periods to the extent reasonably possible.	Not required.	Not required.	Not required.
		Prevent vehicle strikes, especially during sensitive periods.	Restrict vehicle traffic to daytime hours, and limit speeds to 30 km or less on roads near snake hibernacula (including signage) during sensitive periods.			

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
	Degradation of hibernacula through changes in water flow or surface water drainage patterns.	Maintain existing surface water flow patterns.	Maintain surface flow patterns in vicinity of hibernacula by installing properly designed and sited culverts under access roads or in other areas, as required.	Culvert locations.	Construction Supervisor to regularly visually monitor culvert installations to ensure flow conveyance, with no restrictions or ponding.	If flow conveyance is impeded, determine cause (i.e., blocked by debris, beaver activity etc.) and physically clear problematic material from culvert opening.
	Degradation of hibernacula through surface flow contamination.	Prevent contamination through surface flow during construction and spills.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	All E&S control measures to be regularly monitored by Construction Supervisor, particularly when inclement weather events anticipated (i.e., high winds, rain events) to ensure they are functioning as intended.	Sediment will be removed if it is found to accumulate.
			Implement Dewatering measures if applicable (see Section 6.3.1.3).			Keep emergency spill kits on site.
			All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from habitat.			Implement MOE spill action plan if necessary.
						Dispose of waste material by authorized and approved offsite vendors.
Rare Vegetation Communities						
2 Rare Vegetation Communities were identified in and within 120m of the Project Location (rv2, rv3)	Degredation of habitat through erosion and sedimentation.	Prevent contamination by sediment and erosion.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	Daily when construction activities occur within the immediate vicinity of feature deer congregational areas and when inclement weather is anticipated (i.e. rain events).	Any build up of sediment beyond the E&S control points will be cleaned up and removed to avoid risk of further spread of sediment.
			Erosion control measures will remain in place until disturbed soils have stabilized.			Sediment will be removed if it is found to accumulate.
			Stockpile materials >30m from the edge of rare vegetation communities. Where this is not possible stockpiles will be covered when not in use,	All stockpiles within 30m of rare vegetation communities (if applicable).	All covers on stockpiles to be put in place and checked when inclement weather events anticipated (i.e. high winds, rain	Sediment will be removed if it is found to accumulate within the root zones of significant woodlands.
	Accidental damage to vegetation.	Prevent accidental damage to vegetation.	Clearly delineate work area using a barrier such as a silt fence to avoid accidental vegetation damage.	Check silt fencing along the periphery of rare vegetation communities.	Daily when construction activities occur within the immediate vicinity of rare vegetation communitiies and when inclement weather is anticipated (i.e. rain events).	Any tree limbs or root zones that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.
			Workers will be advised not to trespass beyond the boundary of the marked area.			
			Re-vegetate disturbed areas with fast growing native species as soon as construction activity within the disturbed areas is complete.	Check that seed grows in areas of disturbance within one growing season.	Once after seeding area.	Replant areas where seed does not grow to ensure vegetation establishes within the growing season.
	During construction, there will be the potential for accidental spills.	Prevent contamination from accidental spills.	All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from significant woodlands.	Not required.	Not required.	Keep emergency spill kits on site.
						Implement MOE spill action plan if necessary.
						Dispose of waste material by authorized and approved offsite vendors.
	Changes in soil moisture and compaction in rare vegetation communities.	Avoid changes to soil moisture and compaction in rare vegetation communities.	Implement infiltration (i.e. minimize paved surfaces and design roads to promote infiltration) techniques to the maximum extent possible to avoid changes in soil moisture and compaction.	Not required.	Not required.	Not required.
Specialized Habitats for Wildlife						
Turtle Nesting Areas - Snapping Turtle	Habitat avoidance, disturbance and mortality from construction activities.	Minimize disturbance, especially during sensitive periods when turtles are emerging from their overwintering habitat to nest (Apr/May)	Construction in the vicinity of turtle nesting habitat should avoid sensitive periods to the extent reasonably possible.	Not required.	Not required.	Not required.

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
		Prevent vehicle strikes, especially during sensitive periods.	Restrict vehicle traffic to daytime hours, and limit speeds to 30 km or less on roads near turtle nesting habitat (including signage) during sensitive periods.			
	Degradation of turtle nesting habitat through changes in water flow or surface water drainage patterns.	Maintain existing surface water flow patterns.	Maintain surface flow patterns in vicinity of turtle nesting habitat by installing properly designed and sited culverts under access roads or in other areas, as required.	Culvert locations.	Construction Supervisor to regularly visually monitor culvert installations to ensure flow conveyance, with no restrictions or ponding.	If flow conveyance is impeded, determine cause (i.e., blocked by debris, beaver activity etc.) and physically clear problematic material from culvert opening.
	Degradation of turtle nesting habitat through surface flow contamination.	Prevent contamination through surface flow during construction and spills.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	All E&S control measures to be regularly monitored by Construction Supervisor, particularly when inclement weather events anticipated (i.e., high winds, rain events) to ensure they are functioning as intended.	Sediment will be removed if it is found to accumulate.
			Implement Dewatering measures if applicable (see Section 6.3.1.3).			Keep emergency spill kits on site.
			All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from habitat.			Implement MOE spill action plan if necessary.
			Fuel storage will be in properly protected and sealed areas.			Dispose of waste material by authorized and approved offsite vendors.
	Shifts in species abundance, avoidance and behaviour during wind construction	Monitor potential impacts of construction	Monitor for turtle disturbance	At Significant habitats within 30m of an access road	1 year post construction monitoring	
					Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation. If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed	
Amphibian Breeding Habitat (woodland and wetland): Breeding ponds in woodland and wetland habitats throughout the ZOI	Loss of breeding ponds and adjacent woodland habitat.	Minimize removal of breeding ponds and clearing in forest immediately adjacent to breeding ponds.	Delineate potential breeding ponds within/adjacent to constructible areas.	Ensure that seed becomes established in areas of disturbance within one growing season.	Once after seeding area.	Reseed areas where seed does not become adequately establish to ensure stabilizing vegetative cover establishes within the growing season.
			Avoid construction in breeding ponds, where possible. Minimize site disturbance and alterations to surface drainage patterns in vicinity of breeding ponds.		Once in late spring the year following seeding.	
			Implement Vegetation Removal measures (see Section 6.3.1.1).			
			Re-vegetate disturbed areas with fast growing native species as soon as practical after construction activity within the disturbed areas is complete.			

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
			In order to avoid impacts associated with breeding, construction and decommissioning phases will occur, to the extent reasonably practical outside amphibian breeding months (Apr.-June).			
	Degradation of breeding ponds through surface flow contamination.	Prevent contamination through surface flow during construction and spills.	Implement Dewatering measures (see Section 6.3.1.3).	Not required.	Not required.	Keep emergency spill kits on site.
			All maintenance activities, vehicle refueling or washing and chemical storage will be located more than 30m from habitat.			Implement MOE spill action plan if necessary.
						Dispose of waste material by authorized and approved offsite vendors.
	Degradation of breeding ponds through sedimentation.	Prevent contamination by sediment and erosion.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	All E&S control measures checked when inclement weather events anticipated (i.e., high winds, rain events).	Sediment will be removed if it is found to accumulate.
					All E&S control measures to be regularly monitored by Construction Supervisor to ensure they are functioning as intended.	If siltation of surface water is identified, the source of siltation will be isolated, contained, and controlled and sediment control measures increased as required to prevent additional sedimentation.
						Erosion control measures will remain in place until disturbed soils have stabilized.
	Degradation of breeding ponds through changes in water flow or surface water drainage patterns.	Maintain existing surface water flow patterns.	Maintain surface flow patterns to breeding ponds by installing properly designed and sited culverts under access roads or other locations, as required..	Culvert locations.	Construction Supervisor to regularly visually monitor culvert installations to ensure flow conveyance, with no restrictions or ponding.	If flow conveyance is impeded, determine cause (i.e., blocked by debris, beaver activity etc.) and physically clear problematic material from culvert opening.
	Road mortality.	Prevent vehicle strikes, especially during sensitive breeding periods (April-June).	Restrict vehicle traffic to daytime hours, and limit speeds to 30 km or less on roads near woodland amphibian breeding ponds (including signage).	Not required.	Not required.	Not required.
	Shifts in species abundance, avoidance and behaviour during wind construction	Monitor potential impacts of construction	Monitor for amphibian disturbance	At Significant habitats within 30m of an access road	1 year post construction monitoring	
					Report the findings of all monitoring programs to MNR on an annual basis for the first 3 years of operation. If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed	
ANSI's						
Provincially Significant Life Science and Earth Science ANSI	Loss of part of the feature	Minimize the disturbance area.	Implement Vegetation Removal measures (see Section 6.3.1.1).	In and around the staked boundary of the habitat to be cleared.	During vegetation removal activities.	If clearing of vegetation occurs beyond defined limits, the area should be rehabilitated to pre-disturbance conditions.

Table 6.1: Summary of Potential Effects and Mitigation Measures for Significant Wildlife Habitat - Construction and Operation

Unique Feature ID (see Figures 6.1-6.9)	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Construction Monitoring Plan		Contingency Measure
				Monitoring Locations	Frequency of Monitoring	
	Degredation of the ANSI through erosion and sedimentation.	Prevent contamination by sediment and erosion.	Implement Sediment and Erosion control measures (see Section 6.3.1.2).	All E&S control points.	All E&S control measures checked when inclement weather events anticipated (i.e., high winds, rain events).	Any build up of sediment beyond the E&S control points will be cleaned up and removed to avoid risk of further spread of sediment.
					All E&S control measures to be regularly monitored by Construction Supervisor to ensure they are functioning as intended.	Sediment will be removed if it is found to accumulate.

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
Wind Turbine Erection	Clearing, grubbing, grading, and topsoil removal	• Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction	• Develop and implement an erosion and sediment control plan, • Utilize erosion blankets, silt fencing, straw bales, etc for construction activities within 30m of a wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Suspend work if high runoff volume is noted or excessive sediment discharge occurs, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive slopes	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Noise/human activity	• Disturbance and/or mortality to local wildlife	• Clearly post construction speed limits	• Limit potential wildlife road mortalities
	Accidental damage to vegetation	• Damage or removal of vegetation adjacent to the project location	• Where construction activity occurs within 30m of a naturally vegetated feature (ie a significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques	• Minimize impacts to natural vegetation • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Chemical spills or accidental fluid release (ie oil, gasoline, grease, etc)	• Soil or water contamination	• Implement best management practices, • Develop a spill response plan and train staff on appropriate procedures, • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, • Dispose of waste material by authorized and approved offsite vendors	• Minimize impacts to natural features and wildlife habitats, • Avoid contamination of water or wetland features
	Dewatering activities (if necessary)	• Reduced stream flow rate, • Increased water temperature	• Control rate and timing of water pumping, • Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands or use off-site water, • Do not take water during periods of extreme low flow	• Maintain ground and surface water conditions with those near pre-construction conditions

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
	Installation of impervious surfaces	• Increase surface run-off, • Changes in surface water drainage	• Develop and implement an erosion and sediment control plan, • Utilize erosion blankets, silt fencing, straw bales, etc for construction activities within 30m of a significant wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, or heavy machinery traffic on sensitive slopes, • Re-vegetate temporary roads to pre-construction conditions as soon as possible after construction activities are complete	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Monitor silt fencing daily when work is taking place at the location and before and after storm events
Temporary Access Roads, Crane Paths, and Turnaround Areas	Clearing, grubbing, grading, and topsoil removal	• Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction	• Develop and implement an erosion and sediment control plan, • Utilize erosion blankets, silt fencing, straw bales, etc for construction activities within 30m of a significant wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, or heavy machinery traffic on sensitive slopes, • Re-vegetate temporary roads to pre-construction conditions as soon as possible after construction activities are complete	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Noise/human activity	• Disturbance and/or mortalit	• Avoid construction or decommissioning activities during sensitive time periods (ie breeding bird season), wherever possible, • Conduct nest searches if vegetation removal will occur during the breeding bird season (May 1-July 31) • Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible, • Clearly post construction speed limits	• Limit potential wildlife road mortalities

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
	Accidental damage to vegetation	• Damage or removal of vege	• Where construction activity occurs within 30m of a naturally vegetated feature (ie significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques	• Minimize impacts to natural vegetation • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Chemical spills or accidental fluid release (ie oil, gasoline, diesel fuel, grease, etc)	• Soil or water contamination	• Implement best management practices, • Develop a spill response plan and train staff on appropriate procedures, • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural	• Minimize impacts to natural features and wildlife habitats, • Avoid contamination of water or wetland features
	Installation of impervious surfaces	• Increase surface run-off, • Changes in surface water drainage	• Maintain vegetative buffers around water bodies, • Control quantity and quality of stormwater discharge using best management practices, • Minimize grading activities to maintain existing drainage patterns as much as possible	• Limit disturbances to surface water drainage patterns
Permanent Access Roads	Clearing, grubbing, grading, and topsoil removal	• Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction	• Develop and implement an erosion and sediment control plan, • Utilize erosion blankets, silt fencing, straw bales, etc for construction activities within 30m of a wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive slopes	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Noise/human activity	• Disturbance and/or mortality to local wildlife	• Avoid construction or decommissioning activities during sensitive time periods (ie breeding bird season), wherever possible, • Conduct nest searches if vegetation removal will occur during the breeding bird season (May 1-July 31) • Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible, • Clearly post construction speed limits	• Limit potential wildlife road mortalities

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
	Accidental damage to vegetation	• Damage or removal of vegetation adjacent to the project location	• Where construction activity occurs within 30m of a naturally vegetated feature (ie significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques	• Minimize impacts to natural vegetation • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Chemical spills or accidental fluid release (ie oil, gasoline, grease, etc)	• Soil or water contamination	• Implement best management practices, • Develop a spill response plan and train staff on appropriate procedures, • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, • Dispose of waste material by authorized and approved offsite vendors	• Minimize impacts to natural features and wildlife habitats, • Avoid contamination of water or wetland features
	Installation of impervious surfaces	• Increase surface run-off, • Changes in surface water drainage	• Maintain vegetative buffers around water bodies, • Control quantity and quality of stormwater discharge using best management practices, • Minimize grading activities to maintain existing drainage patterns as much as possible	• Limit disturbances to surface water drainage patterns
Underground Cabling	Clearing, grubbing, grading, and topsoil removal	• Increased erosion and sedimentation into woodlands, wetlands, and other natural features	• Develop and implement an erosion and sediment control plan, • Locate all entry and exit pits at least 30m from natural features (ie woodlands, wetlands) or water bodies, • Collect drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body • Horizontal directional drill entry/exit pits should be located at least 30m from any significant natural feature • Restore and re-vegetate entry/exit pits to pre-construction conditions as soon as possible after construction	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Minimize the presence of exposed soil to reduce the potential for erosion

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
	Noise/human activity	• Disturbance and/or mortality to local wildlife	• Avoid construction or decommissioning activities during sensitive time periods (ie breeding bird season), wherever possible, • Construction and decommissioning activities within 30m of woodlands or wetlands should occur during daylight hours, wherever possible, • Restore and re-vegetate entry and exit pits to pre-construction conditions as soon as possible after construction	• Limit potential wildlife road mortalities
	Accidental damage to vegetation	• Damage or removal of vegetation adjacent to the project location	• Where construction activity occurs within 30m of a naturally vegetated feature (ie significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques	• Minimize impacts to natural vegetation • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Chemical spills or accidental fluid release (ie oil, gasoline, grease, etc)	• Soil or water contamination	• Implement best management practices, • Develop a spill response plan and train staff on appropriate procedures, • Keep emergency spill kits on site, • Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies, • Ensure drill depth is at an appropriate level below the watercourse to prevent 'frac-out', • Drill entry and exit pits should be at least 30m from natural features (ie significant woodland or wetland) or water bodies, • Dispose of waste material by authorized and approved offsite vendors • Collect horizontal directional drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal	• Minimize impacts to natural features and wildlife habitats, • Avoid contamination of water or wetland features

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
Transmission Line	Clearing, grubbing, grading, and topsoil removal	• Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction	• Develop and implement an erosion and sediment control plan, • Utilize erosion blankets, silt fencing, straw bales, etc for construction activities within 30m of a wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Suspend work if high runoff volume is noted or excessive sediment discharge occurs, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive slopes	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Monitor silt fencing daily when work is taking place at the location and before and after storm events
	Accidental damage to vegetation	• Damage or removal of vegetation adjacent to the project location	• Where construction activity occurs within 30m of a naturally vegetated feature (ie a significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques	• Minimize impacts to natural vegetation • Monitor silt fencing daily when work is taking place at the location and before and after storm events
Overhead Collector Line	Clearing, grubbing, grading, and topsoil removal	• Increased erosion and sedimentation into woodlands, wetlands, and other natural features, • Soil compaction	• Develop and implement an erosion and sediment control plan, • Utilize erosion blankets, silt fencing, straw bales, etc for construction activities within 30m of a wetland, woodland, or water body, • Maintain erosion control measures for the duration of construction or decommissioning activities, • Suspend work if high runoff volume is noted or excessive sediment discharge occurs, • Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body, • No vehicle traffic on exposed soils, and no heavy machinery traffic on sensitive slopes	• Minimize direct impacts on vegetation communities and protect rare/sensitive habitats, • Maintain vegetated buffers, particularly within riparian zones, • Minimize the impacts of sedimentation on nearby natural features • Monitor silt fencing daily when work is taking place at the location and before and after storm events

Table 6.2: Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat - Construction and Operation

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring and Contingency Plans
	Accidental damage to vegetation	• Damage or removal of vegetation adjacent to the project location	• Where construction activity occurs within 30m of a naturally vegetated feature (ie a significant woodland or wetland), the construction area should be clearly delineated with protective fencing, such as silt fencing, • Damaged trees should be pruned through implementation of proper arboricultural techniques	• Minimize impacts to natural vegetation • Monitor silt fencing daily when work is taking place at the location and before and after storm events

Appendix C

MNR Correspondence

Ministry of
Natural Resources
Renewable Energy Operations Team
300 Water Street
4th Floor, South Tower
Peterborough, Ontario K9J 8M5

Ministère des
Richesses naturelles

Ontario

April 22nd, 2013

Niagara Region Wind Corporation
277 Lakeshore Road East, Suite 211
Oakville, Ontario L6J 6J3

RE: Modifications to Niagara Region Wind Farm

Dear Darren Croghan,

The Ministry of Natural Resources (MNR) has received the addendum report dated April 8, 2013 that describes modifications to the Niagara Region Wind Farm Project made subsequent to MNR's letter confirming the Natural Heritage Assessment in respect of the project.

The addendum report addresses MNR's concern associated with the access road to turbine 89. Upon review of the addendum report, MNR is satisfied that the Natural Heritage Assessment requirements of Ontario Regulation 359/09 have been met. Please add this letter as an addendum to the confirmation letter issued April 3, 2013 for the Niagara Region Wind Farm Project.

If you wish to discuss, please contact Amy Cameron at Amy.Cameron@Ontario.ca or 613-732-5506.

Sincerely,

Sharon Rew
A/Regional Resources Section Manager
Southern Region MNR

cc Amy Cameron, Renewable Energy Planning Ecologist, MNR
Ian Hagman, Guelph District Manager, MNR
Narren Santos, Environmental Approvals Access & Service Integration Branch, MOE
Zeljko Romic, Environmental Approvals Access & Service Integration Branch, MOE

Ministry of
Natural Resources
Renewable Energy Operations Team
300 Water Street
4th Floor, South Tower
Peterborough, Ontario K9J 8M5

Ministère des
Richesses naturelles

Ontario

April 2nd, 2013

Niagara Region Wind Corporation
277 Lakeshore Road East, Suite 211
Oakville, Ontario L6J 6J3

RE: NHA Confirmation for Niagara Region Wind Farm

Dear Darren Croghan:

In accordance with the Ministry of the Environment's (MOE's) Renewable Energy Approvals (REA) Regulation (O.Reg.359/09), the Ministry of Natural Resources (MNR) has reviewed the Niagara Region Wind Farm – Natural Heritage Assessment and Environmental Impact Study for the Niagara Region Wind Farm in the Townships of West Lincoln and Wainfleet, the Town of Lincoln, and within Haldimand County submitted by Niagara Region Wind Corporation on March 26th, 2013.

In accordance with Section 28(2) and 38(2)(b) of the REA regulation, MNR provides the following confirmations following review of the natural heritage assessment:

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, if no natural features were identified.
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), MNR also offers the following comments in respect of the project.

Preconstruction Monitoring

In accordance with Appendix D of MNR's NHA Guide, a commitment has been made to complete pre-construction assessment(s) of habitat use for the following candidate significant wildlife habitats

- Migratory Land-bird Stopover Area (features misa3 and misa4. Fall-surveys only)
- Bat Maternity Colony (features bmc1, bmc3, bmc6, bmc7, bmc8, bmc9, bmc10, bmc11, bmc12, bmc13, bmc14, bmc15, bmc16, bmc17, bmc18, bmc19, bmc20, bmc23, bmc24, bmc25, bmc26, bmc27, bmc28, bmc29, bmc30, bmc31, bmc32, bmc33, bmc34, bmc35, bmc36, bmc37, bmc38, bmc39, bmc42, bmc43, bmc44, bmc45, bmc46, bmc47, bmc48, bmc49, bmc50, bmc51, bmc52, bmc53, bmc54, bmc55)
- Turtle Wintering Area (feature tw1)
- Snake Hibernacula (features sh2, sh3, sh4, sh6, sh7)
- Turtle Nesting Habitat (features th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69)

MNR has reviewed and confirmed the assessment methods and the range of mitigative options. Pending completion of the assessments and determination of significance, the appropriate mitigation is expected to be implemented, as committed to in the environmental impact study.

Access road to Turbine 89

A field visit must be conducted with MNR prior to construction to determine site specific impacts of the proposed access road. If upon completion of the site assessment it is determined that negative impacts to the ANSI cannot be mitigated as determined in the NHA, **MNR does not support the proposed access road location**. The proponent may submit an addendum report detailing a new access road location, potential negative effects and mitigation measures for MNR's consideration.

Post-Construction Monitoring

In addition to the NHA, Environmental Effects Monitoring Plans (EEMP) that address post-construction mortality monitoring and mitigation for birds and bats must be prepared and implemented. Environmental Effects Monitoring Plans for birds and bats must be prepared in accordance with MNR Guidelines and should be reviewed by MNR in advance of submitting a REA application to MOE in order to minimize potential delays in determining if the application is complete. Comments provided by the MNR with respect to the EEMP must be submitted as part of the application for a REA.

A commitment has been made in the Environmental Effects Monitoring Plan, part of the Design and Operations Report, to conduct post-construction monitoring and if determined necessary, implement mitigation measures. For the Niagara Region Wind Farm this includes;

- Migratory Land-bird Stopover Area (features misa1, misa3, misa4)
- Raptor Wintering Area (wr1, wr2, wr3, wr4)

- Bat Maternity Colony (features bmc1, bmc3, bmc6, bmc7, bmc8, bmc9, bmc10, bmc11, bmc12, bmc13, bmc14, bmc15, bmc16, bmc17, bmc18, bmc19, bmc20, bmc23, bmc24, bmc25, bmc26, bmc27, bmc28, bmc29, bmc30, bmc31, bmc32, bmc33, bmc34, bmc35, bmc36, bmc37, bmc38, bmc39, bmc42, bmc43, bmc44, bmc45, bmc46, bmc47, bmc48, bmc49, bmc50, bmc51, bmc52, bmc53, bmc54, bmc55)
- Turtle Nesting Habitat (features th3, th5, th9, th10, th19, th21, th26, th28, th29, th38, th39, th40, th41, th42, th45, th46, th62, th69)
- Amphibian Breeding Habitat (Woodland) (features ah2, ah9, ah29, ah31, ah37, ah38, ah49, ah57, ah61, ah89)
- Amphibian Breeding Habitat (Wetland) (features ah25, ah35, ah83)

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 NHA, MNR may need to undertake additional review of the NHA.

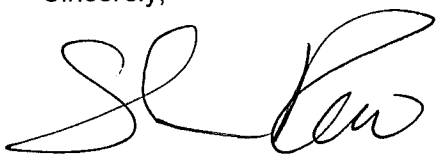
Where specific commitments have been made by the applicant in the NHA/EIS with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNR expects that these commitments will be considered in MOE's Renewable Energy Approval decision and, if approved, be implemented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

In accordance with S.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.

Please be aware that your project may be subject to additional legislative approvals as outlined in the Ministry of Natural Resources' *Approvals and Permitting Requirements Document*. These approvals are required prior to the construction of your renewable energy facility.

If you wish to discuss any part of this confirmation or additional comments provided, please contact Amy Cameron at amy.cameron@ontario.ca or 613-732-5506.

Sincerely,



Sharon Rew
A\Regional Resources Section Manager
Southern Region MNR

cc Ian Hagman, Guelph District Manager, MNR
Narren Santos, Environmental Approvals Access & Service Integration Branch, MOE
Zeljko Romic, Environmental Approvals Access & Service Integration Branch, MOE

Appendix D

Background Wildlife List

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
ODONATES								
Azure Bluet	*Enallagma aspersum*	S3	G5			MNR/NHIC		
Mottled Darner	*Aeshna clepsydra*	S3	G4			MNR/NHIC		
Swamp Darner	*Epiaeschna heros*	S2S3	G5			MNR/NHIC		
Cyrano Darner	*Nasiaeschna pentacantha*	S3	G5			MNR/NHIC		
Unicorn Clubtail	*Arigomphus villosipes*	S2S3	G5			MNR/NHIC		
Arrow Clubtail	*Stylurus spiniceps*	S2	G5			MNR/NHIC		
Variegated Meadowhawk	*Sympetrum corruptum*	S3	G5			MNR/NHIC		
BUTTERFLIES								
Giant Swallowtail	*Papilio cresphontes*	S3	G5			MNR/NHIC		
Monarch	*Danaus plexippus*	S4B, S2N	G5	SC	SC	MNR/NHIC		
AMPHIBIANS								
Red-spotted Newt	*Notophthalmus viridescens*	S5	G5T5			HA		
Blue-spotted Salamander	*Ambystoma laterale*	S4	G5			HA		
Jefferson Salamander	*Ambystoma jeffersonianum*	S2	G5	END	END	MNR/HA		
Spotted Salamander	*Ambystoma maculatum*	S4	G5			HA		
Four-toed Salamander	*Hemidactylium scutatum*	S4	G5	NAR	NAR	HA		
Northern Redback Salamander	*Plethodon cinereus*	S5	G5			HA		
American Toad	*Anaxyrus americanus*	S5	G5			HA		
Fowler's Toad	*Anaxyrus fowleri*	S2	G5	END	END	MNR/HA		
Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5			HA		
Western Chorus Frog (carolinian)	*Pseudacris triseriata*	S4	G5	NAR	NAR	HA		
Spring Peeper	*Pseudacris crucifer*	S5	G5			HA		
Bullfrog	*Lithobates catesbeiana*	S4	G5			HA		
Northern Green Frog	*Lithobates clamitans*	S5	G5			HA		
Pickerel Frog	*Lithobates palustris*	S4	G5	NAR	NAR	HA		
Wood Frog	*Lithobates sylvatica*	S5	G5			HA		
Northern Leopard Frog	*Lithobates pipiens*	S5	G5	NAR	NAR	HA		
REPTILES								
Snapping Turtle	*Chelydra serpentina*	S3	G5	SC	SC	MNR/HA		
Midland Painted Turtle	*Chrysemys picta marginata*	S5	G5T5			HA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Northern Map Turtle	*Graptemys geographica*	S3	G5	SC	SC	MNR/HA		
Blanding's Turtle	*Emydoidea blandingi*	S3	G4	THR	THR	MNR/HA		
Spotted Turtle	*Clemmys guttata*	S3	G5	END	END	MNR/HA		
Eastern Spiny Softshell	*Apalone spinifera spinifera*	S3	G5	THR	THR	MNR/HA		
Five-lined Skink (carolinian)	*Eumeces fasciatus*	S3	G5	END	END	MNR/HA		
Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5			HA		
Eastern Ribbon Snake	*Thamnophis sauritus*	S3	G5	SC	SC	MNR/HA		
Northern Watersnake	*Nerodia sipedon sipedon*	S5	G5T5	NAR	NAR	HA		
Redbelly Snake	*Storeria occipitomaculata*	S5	G5			HA		
Brown Snake	*Storeria dekayi*	S5	G5		NAR	HA		
Smooth Greensnake	*Opheodrys vernalis*	S4	G5			HA		
Ringneck Snake	*Diadophis punctatus*	S4	G5			HA		
Eastern Hog-nosed Snake	*Heterodon platirhinos*	S3	G5	THR	THR	MNR/HA		
Gray Ratsnake (carolinian)	*Pantherophis spiloides*	S3	G5T5	END	END	MNR/HA		
Eastern Milksnake	*Lampropeltis triangulum*	S3	G5	SC	SC	MNR/HA		
Eastern Massasauga	*Sistrurus catenatus catenatus*	S3	G3G4T4	THR	THR	MNR/HA		
BIRDS								
Canada Goose	*Branta canadensis*	S5	G5			OBBA		
Mute Swan	*Cygnus olor*	SNA	G5			OBBA		
Wood Duck	*Aix sponsa*	S5	G5			OBBA		
American Black Duck	*Anas rubripes*	S4	G5			OBBA		
Mallard	*Anas platyrhynchos*	S5	G5			OBBA		
Blue-winged Teal	*Anas discors*	S4	G5			OBBA		
Northern Shoveler	*Anas clypeata*	S4	G5			OBBA		
Ring-necked Pheasant	*Phasianus colchicus*	SNA	G5			OBBA		
Ruffed Grouse	*Bonasa umbellus*	S5	G5			OBBA		Sandilands 2005
Wild Turkey	*Meleagris gallopava*	S5	G5			OBBA		
Pied-billed Grebe	*Podilymbus podiceps*	S4B,S4N	G5			OBBA		
Double-crested Cormorant	*Phalacrocorax auritus*	S5B	G5	NAR	NAR	OBBA		Sandilands 2005
Great Blue Heron	*Ardea herodias*	S5	G5			OBBA		
Green Heron	*Butorides virescens*	S4B	G5			OBBA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Turkey Vulture	*Cathartes aura*	S5B	G5			OBBA		
Bald Eagle	*Haliaeetus leucocephalus*	S2B,S4N	G4	SC	NAR	MNR/OBBA	X	
Northern Harrier	*Circus cyaneus*	S4B	G5	NAR	NAR	OBBA	X	Sandilands 2005
Sharp-shinned Hawk	*Accipiter striatus*	S5	G5	NAR	NAR	OBBA		Sandilands 2005
Cooper's Hawk	*Accipiter cooperii*	S4	G5	NAR	NAR	OBBA		Sandilands 2005
Red-shouldered Hawk	*Buteo lineatus*	S4B	G5		NAR	OBBA	X	Sandilands 2005
Broad-winged Hawk	*Buteo platypterus*	S5B	G5			OBBA		Sandilands 2005
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	NAR	NAR	OBBA		
American Kestrel	*Falco sparverius*	S5B	G5			OBBA	X	
King Rail	*Rallus elegans*	S2B	G4G5	END	END	OBBA		
Virginia Rail	*Rallus limicola*	S5B	G5			OBBA		
Sora	*Porzana carolina*	S4B	G5			OBBA		
Piping Plover	*Charadrius melodus*	S1B	G3	END	END	OBBA		
Killdeer	*Charadrius vociferus*	S5B, S5N	G5			OBBA		
Spotted Sandpiper	*Actitis macularia*	S5	G5			OBBA		
Upland Sandpiper	*Bartramia longicauda*	S4B	G5			OBBA		
American Woodcock	*Scolopax minor*	S4B	G5			OBBA		
Wilson's Phalarope	*Phalaropus tricolor*	S3B	G5			OBBA		
Ring-billed Gull	*Larus delawarensis*	S5B,S4N	G5			OBBA		
Herring Gull	*Larus argentatus*	S5B,S5N	G5			OBBA		
Caspian Tern	*Hydroprogne caspia*	S3B	G5	NAR	NAR	OBBA		
Black Tern	*Chlidonias niger*	S3B	G4	SC	NAR	MNR/OBBA		Dunn and Agro, 1995
Common Tern	*Sterna hirundo*	S4B	G5	NAR	NAR	OBBA		
Rock Pigeon	*Columba livia*	SNA	G5			OBBA		
Mourning Dove	*Zenaida macroura*	S5	G5			OBBA		
Yellow-billed Cuckoo	*Coccyzus americanus*	S4B	G5			OBBA		
Black-billed Cuckoo	*Coccyzus erythropthalmus*	S5B	G5			OBBA	X	
Barn Owl	*Tyto alba*	S1	G5	END	END	MNR/OBBA	X	
Eastern Screech-Owl	*Megascops asio*	S5	G5	NAR	NAR	OBBA		
Great Horned Owl	*Bubo virginianus*	S5	G5			OBBA		
Long-eared Owl	*Asio otus*	S4	G5			OBBA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Short-eared Owl	*Asio flammeus*	S2N, S4B	G5	SC	SC	MNR/OBBA	X	
Common Nighthawk	*Chordeiles minor*	S4B	G5	SC	THR	MNR/OBBA		
Chimney Swift	*Chaetura pelagica*	S4B, S4N	G5	THR	THR	MNR/OBBA	X	
Ruby-throated Hummingbird	*Archilochus colubris*	S5B	G5			OBBA		
Belted Kingfisher	*Ceryle alcyon*	S4B	G5			OBBA	X	
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S4B	G5	SC	THR	OBBA	X	
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5			OBBA		
Yellow-bellied Sapsucker	*Sphyrapicus varius*	S5B	G5			OBBA		
Downy Woodpecker	*Picoides pubescens*	S5	G5			OBBA		
Hairy Woodpecker	*Picoides villosus*	S5	G5			OBBA		
Northern Flicker	*Colaptes auratus*	S4B	G5			OBBA	X	
Pileated Woodpecker	*Dryocopus pileatus*	S5	G5			OBBA		Naylor et al., 1996
Eastern Wood-Pewee	*Contopus virens*	S4B	G5			OBBA	X	
Acadian Flycatcher	*Empidonax virescens*	S2S3B	G5	END	END	MNR/OBBA	X	Austen 1994, Page and Cadman 1994
Alder Flycatcher	*Empidonax alnorum*	S5B	G5			OBBA		
Willow Flycatcher	*Empidonax traillii*	S5B	G5			OBBA	X	
Least Flycatcher	*Empidonax minimus*	S4B	G5			OBBA		
Eastern Phoebe	*Sayornis phoebe*	S5B	G5			OBBA		
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5			OBBA		
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5			OBBA	X	
White-eyed Vireo	*Vireo griseus*	S2B	G5			MNR/OBBA		
Yellow-throated Vireo	*Vireo flavifrons*	S4B	G5			OBBA		
Blue-headed Vireo	*Vireo solitarius*	S5B	G5			OBBA		
Warbling Vireo	*Vireo gilvus*	S5B	G5			OBBA		
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5			OBBA		
Blue Jay	*Cyanocitta cristata*	S5	G5			OBBA		
American Crow	*Corvus brachyrhynchos*	S5B	G5			OBBA		
Horned Lark	*Eremophila alpestris*	S5B	G5			OBBA		
Purple Martin	*Progne subis*	S4B	G5			OBBA		
Tree Swallow	*Tachycineta bicolor*	S4B	G5			OBBA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S4B	G5			OBBA		
Bank Swallow	*Riparia riparia*	S4B	G5			OBBA	X	
Cliff Swallow	*Petrochelidon pyrrhonota*	S4B	G5			OBBA		
Barn Swallow	*Hirundo rustica*	S4B	G5	THR	THR-NS	OBBA		
Black-capped Chickadee	*Poecile atricapillus*	S5	G5			OBBA		
Tufted Titmouse	*Baeolophus bicolor*	S4	G5			OBBA		
Red-breasted Nuthatch	*Sitta canadensis*	S5	G5			OBBA		
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5			OBBA		
Brown Creeper	*Certhia americana*	S5B	G5			OBBA		
Carolina Wren	*Thryothorus ludovicianus*	S4	G5			OBBA		
House Wren	*Troglodytes aedon*	S5B	G5			OBBA		
Winter Wren	*Troglodytes hiemalis*	S5B	G5			OBBA		Hejl et al. 2002
Sedge Wren	*Cistothorus platensis*	S4B	G5	NAR	NAR	OBBA		
Marsh Wren	*Cistothorus palustris*	S4B	G5			OBBA		
Blue-gray Gnatcatcher	*Polioptila caerulea*	S4B	G5			OBBA		
Eastern Bluebird	*Sialia sialis*	S5B	G5	NAR	NAR	OBBA		
Veery	*Catharus fuscescens*	S4B	G5			OBBA		
Wood Thrush	*Hylocichla mustelina*	S4B	G5			OBBA	X	
American Robin	*Turdus migratorius*	S5B	G5			OBBA		
Gray Catbird	*Dumetella carolinensis*	S4B	G5			OBBA		
Northern Mockingbird	*Mimus polyglottos*	S4	G5			OBBA		
Brown Thrasher	*Toxostoma rufum*	S4B	G5			OBBA	X	
European Starling	*Sturnus vulgaris*	SNA	G5			OBBA		
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5			OBBA		
Ovenbird	*Seiurus aurocapilla*	S4B	G5			OBBA		
Louisiana Waterthrush	*Parkesia motacilla*	S3B	G5	SC	SC	MNR	X	
Golden-winged Warbler/ Blue-winged warbler**	*Vermivora chrysoptera/ Vermivora cyanoptera*	S4B	G4/G5	SC/NAR	THR/NAR	OBBA	X	
Blue-winged Warbler	*Vermivora cyanoptera*	S4B	G5			OBBA	X	
Nashville Warbler	*Oreothlypis ruficapilla*	S5B	G5			OBBA		
Mourning Warbler	*Geothlypis philadelphia*	S4B	G5			OBBA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Common Yellowthroat	*Geothlypis trichas*	S5B	G5			OBBA		
Hooded Warbler	*Setophaga citrina*	S3B	G5	SC	NAR	MNR/OBBA	X	
American Redstart	*Setophaga ruticilla*	S5B	G5			OBBA		
Cerulean Warbler	*Setophaga cerulea*	S3B	G4	THR	END	MNR/OBBA	X	
Yellow Warbler	*Setophaga petechia*	S5B	G5			OBBA		
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B	G5			OBBA		
Black-throated Green Warbler	*Setophaga virens*	S5B	G5			OBBA		
Canada Warbler	*Cardellina canadensis*	S4B	G5	SC	THR	OBBA	X	
Yellow-breasted Chat	*Icteria virens*	S2B	G5	SC	SC	MNR/OBBA	X	
Eastern Towhee	*Pipilo erythrophthalmus*	S4B	G5			OBBA	X	
Chipping Sparrow	*Spizella passerina*	S5B	G5			OBBA		
Field Sparrow	*Spizella pusilla*	S4B	G5			OBBA	X	
Vesper Sparrow	*Pooecetes gramineus*	S4B	G5			OBBA	X	
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5			OBBA	X	
Grasshopper Sparrow	*Ammodramus savannarum*	S4B	G5			OBBA	X	
Henslow's Sparrow	*Ammodramus henslowii*	SHB	G4	END	END	MNR/OBBA	X	Herkert, 1991
Song Sparrow	*Melospiza melodia*	S5B	G5			OBBA		
Swamp Sparrow	*Melospiza georgiana*	S5B	G5			OBBA		
Scarlet Tanager	*Piranga olivacea*	S4B	G5			OBBA		
Northern Cardinal	*Cardinalis cardinalis*	S5	G5			OBBA		
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5			OBBA	X	
Indigo Bunting	*Passerina cyanea*	S4B	G5			OBBA		
Bobolink	*Dolichonyx oryzivorus*	S4B	G5	THR	THR-NS	MNR/OBBA	X	
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5			OBBA		
Eastern Meadowlark	*Sturnella magna*	S4B	G5	THR	THR-NS	OBBA	X	
Common Grackle	*Quiscalus quiscula*	S5B	G5			OBBA		
Brown-headed Cowbird	*Molothrus ater*	S4B	G5			OBBA		
Orchard Oriole	*Icterus spurius*	S4B	G5			OBBA		
Baltimore Oriole	*Icterus galbula*	S4B	G5			OBBA	X	
House Finch	*Haemorhous mexicanus*	SNA	G5			OBBA		
American Goldfinch	*Carduelis tristis*	S5B	G5			OBBA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
House Sparrow	*Passer domesticus*	SNA	G5			OBBA		
MAMMALS								
Virginia Opossum	*Didelphis virginiana*	S4	G5			MA		
Northern Short-tailed Shrew	*Blarina brevicauda*	S5	G5			MA		
Hairy-tailed Mole	*Parascalops breweri*	S4	G5			MA		
Star-nosed Mole	*Condylura cristata*	S5	G5			MA		
Small-footed Bat	*Myotis leibii*	S2S3	G3			MNR/NHIC		
Little Brown Bat	*Myotis lucifugus*	S5	G5		END-NS	MA		
Northern Long-eared Bat	*Myotis septentrionalis*	S3?	G4		END-NS	MNR/NHIC		
Silver-haired Bat	*Lasionycteris noctivagans*	S4	G5			MA		
Eastern Pipistrelle	*Pipistrellus subflavus*	S3?	G5		END-NS	MNR/NHIC		
Red Bat	*Lasiurus borealis*	S4	G5			MA		
Big Brown Bat	*Eptesicus fuscus*	S5	G5			MA		
Eastern Cottontail	*Sylvilagus floridanus*	S5	G5			MA		
European Hare	*Lepus europaeus*	SNA	G5			MA		
Eastern Chipmunk	*Tamias striatus*	S5	G5			MA		
Woodchuck	*Marmota monax*	S5	G5			MA		
Grey Squirrel	*Sciurus carolinensis*	S5	G5			MA		
White-footed Mouse	*Peromyscus leucopus*	S5	G5			MA		
Muskrat	*Ondatra zibethicus*	S5	G5			MA		
Meadow Vole	*Microtus pennsylvanicus*	S5	G5			MA		
Woodland Vole	*Microtus pinetorum*	S3?	G5	SC	SC	MNR/MA		
Norway Rat	*Rattus norvegicus*	SNA	G5			MA		
Meadow Jumping Mouse	*Zapus hudsonicus*	S5	G5			MA		
Woodland Jumping Mouse	*Napaeozapus insignis*	S5	G5			MA		
Porcupine	*Erethizon dorsatum*	S5	G5			MA		
Coyote	*Canis latrans*	S5	G5			MA		
Red Fox	*Vulpes vulpes*	S5	G5			MA		
Grey Fox	*Urocyon cineroargenteus*	SNA	G5	THR	THR	MNR		
Raccoon	*Procyon lotor*	S5	G5			MA		
Ermine	*Mustela erminea*	S5	G5			MA		

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Long-tailed Weasel	*Mustela frenata*	S4	G5			MA		
Mink	*Mustela vison*	S4	G5			MA		
Badger	*Taxidea taxus*	S2	G5	END	END	MNR/NHIC		
Striped Skunk	*Mephitis mephitis*	S5	G5			MA		
White-tailed Deer	*Odocoileus virginianus*	S5	G5			MA		
SUMMARY								
Total Odonata:	*7*							
Total Butterflies:	*2*							
Total Amphibians:	*16*							
Total Reptiles:	*18*							
Total Birds:	*137*							
Total Mammals:	*34*							
SIGNIFICANT SPECIES								
Global:	*36*							
National:	*n/a*							
Provincial:	*35*							
Regional:	*n/a*							
Local:	*n/a*							
Explanation of Status and Acronymns								
COSSARO: Committee on the Status of Species at Risk in Ontario								
COSEWIC: Committee on the Status of Endangered Wildlife in Canada								
REGION: Rare in a Site Region								
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)								
S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),								
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)								

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
S4: Apparently Secure—Uncommon but not rare								
S5: Secure—Common, widespread, and abundant in the province								
SX: Presumed extirpated								
SH: Possibly Extirpated (Historical)								
SNR: Unranked								
SU: Unrankable—Currently unrankable due to lack of information								
SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.								
S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species								
S#B- Breeding status rank								
S#N- Non Breeding status rank								
?: Indicates uncertainty in the assigned rank								
G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range								
G1G2: Extremely rare to very rare globally								
G2: Very rare globally; usually between 5-10 occurrences in the overall range								
G2G3: Very rare to uncommon globally								
G3: Rare to uncommon globally; usually between 20-100 occurrences								
G3G4: Rare to common globally								
G4: Common globally; usually more than 100 occurrences in the overall range								
G4G5: Common to very common globally								
G5: Very common globally; demonstrably secure								
T: Denotes that the rank applies to a subspecies or variety								
Q: Denotes that the taxonomic status of the species, subspecies, or variety is **questionable**.								
END: Endangered								
THR: Threatened								
SC: Special Concern								
2, 3 or NS after a COSEWIC ranking indicates the species is either on Schedule 2, Schedule 3 or No Schedule of the Species At Risk Act (SARA)								
NAR: Not At Risk								
IND: Indeterminant, insufficient information to assign status								
DD: Data Deficient								
6: Rare in Site Region 6								
7: Rare in Site Region 7								

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Area: Minimum patch size for area-sensitive species (ha)								
H- highly significant in Hamilton Region (i.e. rare)								
m- moderately significant in Hamilton Region (i.e. uncommon)								
L1- extremely rare locally (Toronto Region)								
L2- very rare locally (Toronto Region)								
L3- rare to uncommon locally (Toronto Region)								
HR- rare in Halton Region, highly significant								
HU- uncommon in Halton Region, moderately significant								
* The Pileated Woodpecker will incorporate smaller woodlots into its homerange, therefore it may not be a true area-sensitive species (Naylor et al. 1996)								
**as part of a conservative approach this listing has been included in the Breeding bird wildlife list.								
LATEST STATUS UPDATE								
Butterflies: December 2011								
Amphibans: December 2011								
Reptiles: December 2011								
Birds: February 2012								
Mammals: February 2012								
S and G ranks and explanations: December 2011								
NOTE								
All rankings for birds refer to breeding birds unless the ranking is followed by N								
REFERENCES								
COSSARO Status								
Endangered Species Act, 2007 (Bill 184). Species at Risk in Ontario List.								
COSEWIC Status								
COSEWIC. 2007. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada. \								

Appendix D
Background Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	Source	Local Status PIF Priority Species (BCR 13)	Area Sensitive Reference
Local Status								
Dwyer, Jill K. 2003. Nature Counts Project Hamilton Natural Areas Inventory 2003. Species Checklists. Hamilton Naturalists Club.								
Halton Natural Areas Inventory 2006: Volume 2 Species Checklists (ISBN 0-9732488-7-4)								
Ontario Partners in Flight. 2006. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13), Priorities, Objectives and Recommended Actions. Environment Canada and Ontario Ministry of Natural Resources. Draft, February 2006.								
Region of Waterloo. 1996. Regionally Significant Breeding Birds.								
TRCA. 2003. Revised Fauna Scores and Ranks, February 2003. Toronto Region Conservation Authority.								
Area-sensitive information								
Austen, M.J.W., M.D. Cadman, and R.D. James. 1994. Ontario birds at risk: status and conservation needs. Toronto and Port Rowan, ON: Federation of Ontario Naturalists and Long Point Bird Observatory. 165 pp.								
Dunn, Erica H. and David J. Agro. 1995. Black Tern (Chlidonias niger), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/147								
Herkert, J.R. 1991. An ecological study of the breeding birds of grassland habitats within Illinois. Ph.D. dissertation. University of Illinois, Urbana, IL. 112 pp.								
Hejl, S.J., J.A. Holmes, and D.E. Kroodsma. 2002. Winter Wren (Troglodtyes troglodytes). In Poole, A., and F. Gill, eds. The birds of North America, No. 623. Philadelphia, PA: The Birds of North America, Inc. 31 pp.								
Naylor, B. J., J. A. Baker, D. M. Hogg, J. G. McNicol and W. R. Watt. 1996. Forest Management Guidelines for the Provision of Pileated Woodpecker Habitat. Ontario Ministry of Natural Resources, Forest Management Branch, Sault Ste. Marie, Ontario. 26 pp.								
Page, A.M., and M.D. Cadman. 1994. Status report on the Acadian Flycatcher Empidonax virescens in Canada. Prepared for the Committee on the Status of Endangered Wildlife in Canada. 27 pp								
Robbins, C.S. 1979. Effect of forest fragmentation on bird populations. Pp. 198-212 in DeGraaf, R.M., and K.E. Evans, eds. Management of northcentral and northeastern forests for nongame birds. United States Department of Agriculture, Forest Service General Technical Report NC-51. 268 pp.								
Sandilands. A. 2005. Birds of Ontario. Habitat Requirements, Limiting Factors and Status. UBC Press.								

Appendix E

Qualifications

Shari L. Muscat B.A., B.E.S.

Project Manager/Environmental Planner

Shari Muscat has over 10 years of experience in environmental resource planning and management. Shari is responsible for planning and coordinating environmental impact assessments, natural environment field programs and biological inventories in support of development, transportation, renewable energy and watershed restoration projects. Shari has been involved in the implementation of the natural heritage and natural hazards policies of the Provincial Policy Statement, Conservation Authorities Regulations, Municipal planning documents and the Renewable Energy Act. Shari has developed a thorough understanding of the complex and evolving policy framework in the Province and a comprehensive understanding of the interconnections between the physical and the natural environment, and maintains a good working relationship with the review and approval agencies.

Formerly with the Grand River Conservation Authority, she developed an extensive working knowledge of watershed management, environmental assessment and natural resources planning through input into the development of GRCA policies, public consultation and coordinating the review and approval of development applications, permits, aggregate applications and Environmental Assessments.

EDUCATION

Bachelor of Arts, Honours, Carleton University, Ottawa, Ontario, 1993

Bachelor of Environmental Studies, Urban and Regional Planning, University of Waterloo, Waterloo, Ontario, 1996

PROJECT EXPERIENCE

Approval Authority Review and Coordination

Waterloo West Side Lands*, Waterloo, Ontario (Resource Planner)

Resource Planner with the GRCA responsible for reviewing and commenting and approving a proposed residential draft plan of subdivision in the City of Waterloo. Duties included coordinating the internal review of draft submissions, consulting with municipal staff and their consultants, preparing position statements on the proposed subdivision and resolving outstanding conflicts.

Environmental Assessments

Activa Weiss Environmental Impact Study, City of Kitchener, Ontario (Task Manager)

Task Manager responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area to support a residential site plan and zone change application. An EIS was prepared that considered the proposed plan of development adjacent to a significant woodlot and wetland, consolidated field investigation results pertaining to vegetation and wildlife assessments, identified the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members and approval agencies.

King and Fountain Streets Class EA, Cambridge, Ontario (Task Manager)

Environmental Planner responsible for the completion of a Natural Environment Report in support of a Class Environmental Assessment for the selection of a roadway alignment for King and Fountain Streets to alleviate road congestion.. In addition to writing the report, my role included agency consultation, corresponding with engineering staff, consolidating field investigation results pertaining to vegetation, wildlife and aquatic assessments to identify opportunities and constraints to be considered during the evaluation of route alternatives

** denotes projects completed with other firms*

Shari L. Muscat B.A., B.E.S.

Project Manager/Environmental Planner

Laurel Creek and Sanitary Sewer EA, Waterloo, Ontario (Task Manager)
Environmental Planner responsible for the completion of a Natural Environment Report in support of a Class Environmental Assessment for the selection of a preferred route for the construction of a trunk sanitary sewer alignment . In addition to writing the report, my role includes agency and public consultation, corresponding with engineering staff, consolidating field investigation results pertaining to vegetation, wildlife and aquatic and fluvial geomorphology assessments to identify opportunities and constraints to be considered during the evaluation of route alternative and recommend opportunities for rehabilitation.

Columbia Lake Environmental Assessment*, Waterloo, Ontario (Resource Planner)
Resource Planner with the GRCA and member of the technical Steering Committee responsible for coordinating the technical review, consulting with DFO, and providing advice to the City of Waterloo for the rehabilitation of Columbia Lake. This involvement focused on providing input to identify environmental constraints and opportunities for improving water quality and enhancing the existing ecological conditions of the lake.

Tullis Estates Butler Pit Application for Aggregate Extraction*, Cambridge, Ontario (Resource Planner)
Resource Planner with the GRCA responsible for coordinating the review of a proposed below water table aggregate extraction application under the Aggregate Resources Act in the Township of North Dumfries. Duties included coordinating the internal review of submissions including operation and rehabilitation plans, consulting with Township and Regional staff, Ministry of Natural Resources and consultants, preparing positions statements on the proposed extraction and resolving outstanding conflicts.

Bridge Street and Bridgeport Bridge EA*, Kitchener, Ontario (Resource Planner)
Resource Planner with the GRCA responsible for coordinating the technical review, consulting with DFO and providing advice to the Region of Waterloo as input to the Environmental Assessment and GRCA permit process for the rehabilitation of the Bridgeport Bridge over the Grand River. This involvement focussed on ensuring the natural hazards associated with flooding and erosion were not aggravated and the natural heritage features and functions were protected from the impacts and design of the new bridge.

Clair Lake Environmental Assessment*, Waterloo, Ontario (Resource Planner)
Resource planner with the GRCA and member of the technical steering committee responsible for coordinating the technical review, consulting with DFO, providing input to the public participation process and providing advice to the City of Waterloo for the rehabilitation of Clair Lake. This involvement focused on providing input to identify environmental constraints and opportunities for improving water quality and enhancing existing ecological conditions of the lake and its upstream reaches.

Fairway Road Extension Class Environmental Assessment*, Kitchener, Ontario (Resource Planner)
Resource Planner with the GRCA responsible for coordinating the technical review, consulting with DFO and providing advice to the Region of Waterloo as input to the Environmental Assessment and GRCA permit process for the extension of Fairway Road over the Grand River. This involvement focussed on ensuring the natural hazards associated with flooding and erosion were not aggravated and the natural heritage features and functions were protected from the impacts and design of the new road and bridge.

Environmental Impact Assessments

Huron Woods Environmental Implementation Report, Kitchener, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Implementation Report to recommend measures to protect the natural features and functions as a result of modifications to the approved draft plan. An EIR was prepared that considered the proposed SWM design, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members

Tutela Heights Subdivision Environmental Impact Study, Brantford, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area. An EIS was prepared that considered the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff, participation in public open houses and active involvement with other study team members.

** denotes projects completed with other firms*

Shari L. Muscat B.A., B.E.S.

Project Manager/Environmental Planner

20 Vic Developments Franklin and Main Environmental Impact Study, Cambridge, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area. An EIS was prepared that considered the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required extensive consultation with the review agencies and it one of the first applications reviewed against the Region of Waterloo's new Significant Woodland Policies. Preparation of this report required the coordination of technical staff and active involvement with other study team members.

Hearthwood Subdivision Environmental Impact Study, KItchener, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area to support a residential plan of subdivision. An EIS is currently being prepared that considers the proposed plan of development adjacent to a woodlot and Provincially Significant Wetland, consolidates field investigation results pertaining to vegetation and wildlife assessments, identifies the potential environmental impacts and discusses mitigation measures for each potential impact. Preparation of this report requires the coordination of technical staff and active involvement with other study team members and approval agencies.

Winzen Developments on Myers Rd. Environmental Impact Study, Cambridge, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area to support a residential plan of subdivision. An EIS is currently being prepared that considers the proposed plan of development adjacent to a significant woodlot and wetland, consolidates field investigation results pertaining to vegetation and wildlife assessments, identifies the potential environmental impacts and discusses mitigation measures for each potential impact. Preparation of this report requires the coordination of technical staff and active involvement with other study team members and approval agencies.

Clerview Stables Environmental Impact Study, Guelph, Ontario (Environmental Planner)
Environmental Planner responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area to support a residential site plan of subdivision. An EIS was prepared that considered the proposed plan of development adjacent to a Provincially Significant Wetland and aquatic habitat features, identified the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required involvement with other study team members and approval agencies.

Sunningdale Meadows Scope Environmental Impact Study, London, Ontario (Environmental Planner)
Environmental Planner responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area to support a residential site plan of subdivision. An EIS was prepared that considered the proposed plan of development adjacent to a an Environmentally Sensitive Area, wetland and aquatic habitat features, identified the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members and approval agencies.

Campbellvale Estates Development Assessment Report, Municipality of Strathroy-Caradoc, Ontario (Task Manager)
Task Manager responsible for the completion of a Development Assessment Report to recommend measures to protect the natural features and functions in the area to support a residential severance and zone change application. A report was prepared that considered the proposed plan of development adjacent to a significant woodlot, identified the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members and approval agencies

** denotes projects completed with other firms*

Shari L. Muscat B.A., B.E.S.

Project Manager/Environmental Planner

Safety Kleen Site Expansion, Township of Woolwich, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Impact Study recommending measures to protect the natural features and functions in the area to support the expansion of an industrial use adjacent to wetland and aquatic habitat features. An EIS was prepared that considered the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff, field investigations and active involvement with other study team members and approval agencies.

Environmental Planning

London Psychiatric Hospital Lands Area Plan, City of London, Ontario (Environmental Planner)
Performed a preliminary environmental constraints analysis for the subject lands, using published resources and initial field investigations, including Chimney Swift surveys, to identify constraints to development. Information was presented to the client in report format

Bridgeport Industrial Subdivision Environmental Impact Study, Kitchener, Ontario (Task Manager)
Task Manager responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area. An EIS was prepared that considered the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members.

Lackner Boulevard and Fairway Road – Environmental Constraint & Opportunities Report, Kitchener, Ontario (Environmental Planner)
Performed a preliminary environmental constraints analysis for the subject lands, using published resources and initial field investigations to identify constraints to development. Information was presented to the client in report format.

North Waterloo Subwatershed Study*, Waterloo, Ontario (Resource Planner)
Resource Planner and Steering Committee member representing the GRCA in support of completing a subwatershed study for the Northwest corner of Waterloo. Duties included providing input into the preparation of the terms of reference for the study. This study was initiated to support future urban expansion for residential development in the City of Waterloo.

Opportunity / Constraint Analysis

El – En Packaging Constraint Analysis, Markham, Ontario (Project Manager)
Performed a preliminary environmental constraints analysis for the subject lands, using published resources and initial field investigations to identify constraints to development. Information was presented to the client in mapping format.

Renewable Energy

Fairview Wind Project, Stayner, Ontario (Task Manager)
Task Manager responsible for the completion of a Natural Heritage Assessment and Environmental Impact Study for review by MNR in support of an application to MOE under the Renewable Energy Act. The assessment included evaluating the proposed impacts of wind turbine components adjacent to natural heritage features.

Grand Renewable Energy Project, Brant County, Ontario (Environmental Planner)
Environmental Planner responsible for assisting with the completion of a Natural Heritage Assessment and Environmental Impact Study for review by MNR in support of an application to MOE under the Renewable Energy Act. The assessment included evaluating the proposed impacts of wind turbine components adjacent to natural heritage features.

** denotes projects completed with other firms*

Chris J. Powell M.A.

Project Manager / Environmental Planner

Chris Powell is an Associate and Team Lead for the Assessment, Permitting and Compliance Group with the Environmental Management Division in Kitchener. Chris has over 11 years of experience in environmental resource planning and management and has successfully managed or participated in more than 100 projects at Stantec. He is responsible for planning and coordinating environmental impact assessments, natural heritage assessments, and biological inventories in support of development, renewable energy, transportation and watershed restoration projects. He is also responsible for planning and coordinating renewable energy approvals (REA) and NHA/EIS confirmations through the MOE and MNR. His thorough understanding of the complex and evolving policy framework in the Province combined with a comprehensive understanding of the interconnections between the physical, biological and hydrological environments provides strategic direction as an effective member of many study teams.

Formerly with the Grand River Conservation Authority, he developed an extensive working knowledge of watershed management, environmental assessment, natural heritage and hazardland planning and policy implementation. He coordinated the GRCA subwatershed planning program and was actively involved with the development of policies, public consultation and coordination of the review and approval of development applications, permits and Environmental Assessments. His experience as a project manager has allowed Chris to identify, assess and overcome potential conflicts to affect project outcomes, while maintaining a good working relationship with review and approval agencies at all government levels.

EDUCATION

B.A., University of Western Ontario, London, Ontario, 1999

M.A., University of Western Ontario, London, Ontario, 2003

PROJECT EXPERIENCE

Renewable Energy

Niagara Region Wind Project, West Lincoln, Ontario (Project Coordinator)

Stantec was retained to complete a Renewable Energy Approval (REA) submission to the Ministry of the Environment (MOE) for a proposed 230 MW wind farm project on behalf of Niagara Region Wind Corporation. As Project Coordinator, Chris is responsible for assembling and coordinating a multidisciplinary team of planners, ecologist, engineers, and consultation experts to facilitate the completion of relevant technical studies, consultation with agencies, public and first nations, and coordination with agency staff and other consulting firms to ensure all regulatory requirements are satisfied. Other tasks include identifying key project issues and constraints, working with project team members to resolve conflicts and plan work-arounds, monitoring key milestones, project scheduling and budgeting, and managing timelines and expectations.

Grand Renewable Energy Park, Haldimand County, Ontario (Natural Heritage Lead)

Stantec was retained to complete a Renewable Energy Approval (REA) submission to the Ministry of the Environment (MOE) for a proposed 250 MW solar and wind farm project on behalf of Samsung Renewable Energy Inc. As a member of the multi-disciplinary project team, Chris was responsible for completing the Natural Heritage Assessment (NHA) and Environmental Impact Study (EIS) in accordance with the Ministry of Natural Resources (MNR) standards and procedures and to secure a letter of confirmation from the MNR as part of the REA application. This involved coordinating the evaluation of significant features, working with the project team and client to refine the layout of project components, assessing environmental impacts and mitigation measures, writing the NHA/EIS reports and working closely with MNR staff at a Provincial and District level to clarify expectations, resolve conflicts and implement emerging MNR guidelines to ultimately obtain final MNR sign-off. Other duties included coordinating the APRD document, assisting with completion of other REA reports, and communicating with the client to effectively plan and coordinate report delivery.

** denotes projects completed with other firms*

Chris J. Powell M.A.

Project Manager / Environmental Planner

Environmental Assessments

Lake Huron Water Transmission Pipeline Twinning Class Environmental Assessment, Middlesex County, Ontario (Natural Environment Advisor)

Stantec was retained to complete a Class Environmental Assessment (Class EA) to identify alternative measures and alignments for maintaining the integrity of the existing watermain that conveys surface water from Lake Huron to the City of London and surrounding areas. Chris acted as an environmental advisor for junior staff to strategically identify constraints, future field work and permit requirements and methods to avoid direct environmental impacts.

Huron Street Watermain Emergency Repairs, London, Ontario (Environmental Coordinator)

In response to a perched watermain within the water column of the Thames River, Stantec was retained to design and obtain approvals for emergency works to protect against possible failure of a large watermain in London. Chris was responsible for coordinating and undertaking agency consultation for this project, including UTRCA, MNR, DFO and Navigable Waters, to ensure compliance with relevant legislation while recognizing the emergency situation. By proactively consulting with these agencies and providing the necessary field observations and background information necessary to facilitate agency review, protection of the watermain was implemented in a timely fashion with due regard for the protection of several aquatic species at risk, shoreline stability, and impact mitigation during construction.

Dorchester South Stormwater Drainage Area Class Environmental Assessment, Dorchester, Ontario (Natural Environment Lead)

Stantec was retained to complete a Class Environmental Assessment (Class EA) for the identification and assessment of stormwater management (SWM) approaches to service the future development of the southern portion of Dorchester. As part of this study, Chris was responsible for coordinating the completion of the fieldwork monitoring program to identify natural heritage constraints for consideration during the future evaluation of SWM alternatives. Consideration for the protection of Dorchester Creek (coldwater), adjacent Provincially Significant Wetland, significant woodlands and source water protection area was identified through a review of background reports, completion of field investigations and agency consultation with UTRCA, MNR and the municipality.

Mayfield Road Improvements Class Environmental Assessment, Peel Region, Ontario (Natural Environment Lead)

Stantec was retained to complete a Class Environmental Assessment (Class EA) for the identification of traffic improvement alternatives along Mayfield Road from Airport Road to Coleraine Road in the Region of Peel. As part of this study, Chris was responsible for coordinating the completion of the Natural Environment Report to identify natural heritage and hazardland constraints for consideration during the evaluation of roadway improvement alternatives. Through consultation with TRCA and MNR staff, the results of aquatic habitat assessments and vegetation surveys were reviewed to confirm constraints, mitigation and permitting requirements. Specific surveys for Redside Dace (Endangered) were approved through Permit from the MNR and in consultation with the Royal Ontario Museum.

Franklin Boulevard Class Environmental Assessment, Cambridge, Ontario (Natural Environment Lead)

Stantec was retained to complete a Class Environmental Assessment (Class EA) for the identification of traffic improvement alternatives along Franklin Blvd. from the 401 to Myers Road in Cambridge. Potential environmental impacts and an assessment of various roadway improvement alternatives were completed based on the Natural Environment Report (NER), which Chris coordinated to identify and assess the existing woodlands, wetlands and watercourse crossings, including Mill Creek and Moffat Creek.

Fox Hollow Sanitary and Stormwater Management Class Environmental Assessment Addendum, London, Ontario (Natural Environment Lead)

An addendum to an approved Municipal Class Environmental Assessment (Class EA) was completed to consider the environmental implications of realigning a portion of the Heard Drain channel for stormwater management (SWM). This enlarged stormwater channel and associated off-line SWM Ponds were approved to provide water quality, quantity and erosion control to protect the downstream environment from the potential impacts of development. Chris coordinated the completion of aquatic and terrestrial habitat assessments and reviewed relevant findings with MNR, UTRCA and City staff to assess potential impacts on the natural heritage system and to recommend mitigation, restoration and enhancement measures for incorporation into the design, construction and monitoring of the proposed facility to provide a net environmental benefit to the Snake Creek subwatershed and associated ecosystem.

Chris J. Powell M.A.

Project Manager / Environmental Planner

Victoria Park Lake Improvements Class Environmental Assessment, Kitchener, Ontario (Natural Environment Lead)

A Class Environmental Assessment (Class EA) was completed to identify improvement alternatives to address water quality concerns in, and upstream of, Victoria Park Lake in Kitchener. As part of the study team, Chris coordinated the Natural Environment Report to identify, characterize and assess the natural environment conditions that contribute to the water quality and sedimentation problems in the lake, which is an on-line lake in the Strasburg Creek with historic and cultural significance. As a member of the steering committee, Chris' role included coordination and summary of aquatic, terrestrial, groundwater, water quality and surface flow investigations, input to the identification of evaluation criteria, identification of alternative measures to improve water quality in the lake, evaluation of upstream and in-lake alternatives, consultation with agency staff, members of the public and the public liaison committee, and input to the selection and preliminary design of the preferred alternative.

South Strasburg Sanitary Sewer Class Environmental Assessment, Kitchener, Ontario (Task Manager)

As input to the Class Environmental Assessment (Class EA) for the selection of a preferred route for the construction of a trunk sanitary sewer to service southwest Kitchener, Chris was responsible for the completion of a Natural Environment Report. Through coordination of the field work program and assessment of environmental constraints based on vegetation, wildlife and aquatic habitat assessments, environmental opportunities and constraints were identified and implications of potential imp[acts evaluated for each of the route alternatives. Chris was also responsible for agency and public consultation and presentation to the Environmental Advisory Committee.

Bridge Street and Bridgeport Bridge EA Natural Environment Report, Kitchener, Ontario (Environmental Planner)

Chris acted as an Environmental Planner responsible for the completion of a Natural Environment Report to characterize the natural environment, identify potential impacts, evaluate alternatives and identify mitigation measures for the roadway and bridge improvements over the Grand River in Kitchener. Responsibilities included agency consultation, coordination of field staff, impact identification and review of the final report to be included as part of the Environmental Study Report for the Class EA.

Rosedale Channel Stabilization Class Environmental Assessment, Brantford, Ontario (Natural Environment Lead)

A Municipal Class Environmental Assessment (Class EA) was completed to recommend opportunities to restore and enhance an eroding watercourse channel within the City of Brantford. In cooperation with Stantec's Water Resources Team, the morphology, capacity and habitat characteristics on two watercourse channels were assessed and appropriate restoration measures recommended, designed and constructed to stabilize the channels while maintaining the natural character and functions they provide. Chris was responsible for completing the Natural Environment Report to describe and assess aquatic, terrestrial and fluvial geomorphological characteristics within the study area, providing input to the evaluation of alternatives, participating at public information centre and consultation with municipal and GRCA staff.

Environmental Impact Assessments

Safety Kleen Expansion Environmental Impact Study, Breslau, Ontario (Environmental Planner)

Chris coordinated the initiation of an Environmental Impact Study (EIS) in support of the proposed expansion of an industrial use in Breslau. Based on background information, field investigations and agency input, Chris identified and assessed the aquatic and terrestrial features within the study area and recommended appropriate mitigation measures for their protection through the proposed expansion. His role included preparing a terms of reference, reviewing site conditions with GRCA staff, coordinating field investigations and facilitating the completion of the EIS. For this project, a stringent health and safety program was imposed by the adjacent land owner, which was implemented during all field investigations. Chris provided guidance and senior level review of the EIS prepared by other members of the study team.

Bridgeport Business Park Environmental Impact Study, Kitchener, Ontario (Environmental Planner)

As an Environmental Planner, Chris was responsible for the completion of an Environmental Impact Study (EIS) in support of a commercial development adjacent to the Grand River in Kitchener. His primary responsibility included coordinating the completion of the EIS through consultation with GRCA and municipal staff, consolidating background information, preparing the terms of reference, coordinating field investigations, assessing the significance of local natural features and recommending appropriate mitigation measures to protect the Grand River, steep valley slopes, wetlands and fish habitat in the area. Chris provided guidance and senior level review of the EIS prepared by other members of the study team.

Chris J. Powell M.A.

Project Manager / Environmental Planner

Edgewater Residential Development Environmental Impact Study, Kilworth, Ontario (Environmental Planner)

As an Environmental Planner, Chris was responsible for the completion of an Environmental Impact Study (EIS) in support of a residential subdivision within a gravel pit along Thames River in Kilworth. His role included a review of background information, consultation with UTRCA, MNR and municipal staff, preparation of a terms of reference, coordination of field investigations, assessing the significance of local natural features and ecological functions and recommending appropriate mitigation measures for incorporation into the proposed draft plan of subdivision. Recommendations included protection of the adjacent significant valleyland, Area of Natural and Scientific Interest (ANSI), Provincially Significant Wetland, adjacent Provincial Park and downstream habitat of aquatic species at risk. As follow-up to the submission of the EIS, Chris was responsible for addressing agency comments and presentation of findings during a public information centre.

Wonderland Pumping Station, London, Ontario (Natural Environment Lead)

To implement the recommendations of a Class Environmental Assessment, Stantec was retained to complete the design of the proposed Wonderland Pumping Station. As part of the project team, Chris was responsible for the completion of an EIS for the construction and operation of a new pumping station in southwest London adjacent to Medway Creek. Based on site specific aquatic and terrestrial habitat assessments, appropriate mitigation measures and site restoration recommendations were incorporated into the design and location of the proposed station to protect adjacent aquatic habitat and secure approvals from the UTRCA.

London Psychiatric Hospital Lands Area Plan, London, Ontario (Natural Environment Lead)

As part of a multi-disciplinary team working for the Ontario Realty Corporation (ORC), Chris is coordinating the completion of the Natural Heritage Study as input to the identification and evaluation of land use scenarios for the re-development of an institutional property in London. Through site specific field investigations, including monitoring of Chimneys Swift (Threatened species) activity within the structures on the property, natural heritage constraints and opportunities were identified for protection and consideration during future development plans. Chris participated in public information centers, consulted with agency staff and provided input to the SWM Class EA process being completed in conjunction with this project.

West Elgin Water Treatment Plant and Constructed Wetland, Elgin County, Ontario (Natural Environment Lead)

Chris coordinated the completion of an Environmental Impact Study (EIS) as input to the background studies influencing the location and design of a proposed water treatment plant. Using available background information and site specific field data, Chris identified and assessed significant natural heritage features within the study area, identified potential impacts and recommended appropriate mitigation measures (buffers, setbacks) to prevent hydrologic, hydrogeologic and ecologic impacts to the adjacent Provincially Significant Wetland, significant woodland and habitat of a Threatened plant species. A constructed wetland feature was recommended as a means of managing wastewater from the plant and enhancing the functions of the adjacent wetland and woodland through re-vegetation and habitat structures.

Thorndale Wastewater Treatment Plant Design and Permitting, Thorndale, Ontario (Environmental Coordinator)

To implement the recommendations of a Class Environmental Assessment, Stantec was retained to undertake the design and construction of a new wastewater treatment plant for the community of Thorndale. Chris managed the environmental impact assessment and approvals component of the project through consultation with UTRCA and MNR staff, coordination of the field work program, and input to the design and impact mitigation plan. Due to the presence of aquatic species at risk in the Thames River, an assessment of habitat characteristics and species surveys were completed with due regard for species protection. Engagement of the First Nations community allowed for the incorporation of Traditional Environmental Knowledge into the impact assessment.

Penetanguishene Mental Health Centre Natural Heritage Study, Penetanguishene, Ontario (Project Manager)

As input to an Optimal Use Study, Chris coordinated the completion of a Natural Heritage Study through a review of existing natural environment features and functions on the subject property. The NHS identified environmental constraints and opportunities for the future re-development of the property, including natural heritage and hazardland constraints associated with the woodlands, wetlands, slopes and adjacent Severn Sound. This information was obtained through agency consultation, a review and assessment of background studies and completion of site specific field investigations.

Chris J. Powell M.A.

Project Manager / Environmental Planner

Craigholme Estates Environmental Impact Study, Belmont, Ontario (Project Manager)

Chris acted as the Environmental Planner responsible for completing an Environmental Impact Study in support of a residential development adjacent to a natural valleyland associated with Kettle Creek. His role included coordinating terrestrial field investigations, identifying and mitigating potential impacts, identifying restoration opportunities and negotiating with agency staff to address environmental concerns and obtain support for the development.

Nash Neighbourhood Environmental Impact Study, Hamilton, Ontario (Project Manager)

As an Environmental Planner, Chris was responsible for the completion of a Scoped Environmental Impact Study (EIS) in support of a mixed use subdivision adjacent to the Niagara Escarpment in Hamilton. This involved scoping the field program through consultation with municipal, NPCA and Niagara Escarpment Commission staff, coordinating aquatic and terrestrial field investigations, assessing potential impacts and recommending appropriate mitigation measures in accordance with the Nash Neighbourhood Secondary Plan.

Heritage Lake Environmental Implementation Report, Puslinch, Ontario (Task Manager)

In support of proposed residential plan of condominium south of Guelph, Chris acted as an Environmental Planner responsible for the completion of an Environmental Implementation Report (EIR) to document how the proposed mitigation, restoration and enhancement measures would be implemented. Adjacent natural features included two coldwater streams, Provincially Significant Wetland and a lake created as a result of former aggregate extraction. His role included the coordinating the establishment of a groundwater and surface water monitoring program, input to landscape restoration plans, preparation of an environmental stewardship guide for future home owners and consultation with Township, MNR and GRCA staff to obtain draft plan approval and clearance of draft plan conditions.

Franklin Pond Meadows Phase 2 Environmental Review Addendum, Cambridge, Ontario (Project Manager)

Chris acted as an Environmental Planner responsible for the completion of an Addendum to the Environmental Impact Study (EIS) prepared in support of the draft plan of subdivision to address agency concerns with the hydrologic impact of the proposed development and road extension on an adjacent Provincially Significant Wetland in Cambridge. The EIS Addendum specifically identified how the hydrologic conditions supporting the wetland and hydrologic functions provided by the wetland would be maintained through the proposed development in order to obtain draft plan approval and to clear draft plan conditions. .

Woodstock North Lands Environmental Impact Study, Woodstock, Ontario (Task Manager)

As an Environmental Planner, Chris was responsible for the completion of an Environmental Implementation Study (EIS) to recommend measures for the protection of aquatic habitat, significant woodlands and Butternut (Endangered) in the area in accordance with the recommendations of the Oxford Natural Heritage Study. This EIS was the first attempt at implementing the ONHS and involved coordination with UTRCA, MNR and City staff, discussions with study team members, public consultation and coordination of technical staff to describe the environment, assess potential impacts and recommend appropriate protection and mitigation measures. Chris also assisted in the preparation of a Permit under the Endangered Species Act to relocate several Butternut trees to avoid potential impacts.

Meadows in the Glen Environmental Implementation Report, Glen Williams, Ontario (Task Manager)

In support of a proposed draft plan of subdivision, Chris acted as an Environmental Planner to complete an Environmental Implementation Report (EIR) that demonstrated how subwatershed study recommendations and Low Impact Development (LID) measures would be implemented to protect and maintain the natural features associated with the Credit River. This project was a Pilot Study for LID in conjunction with the CVC. Chris role included preparation of EIR, coordination of technical staff, input to the study team and negotiations with CVC staff.

Chris J. Powell M.A.

Project Manager / Environmental Planner

Ecological Monitoring

UWO Gibbons Environmental Monitoring, London, Ontario (Project Manager)

As a condition of draft plan approval, annual monitoring for potential impacts or development was required based on an environmental monitoring program established through an EIS. Chris was responsible for coordinating the field monitoring program for aquatic habitat, benthic invertebrates, terrestrial vegetation plots, fluvial geomorphological changes, water quality and general site conditions. He was also responsible for consolidating study findings into a standing report that compared current findings to previous observations, assessed potential impacts and attributed causal factors, where feasible.

Opportunity / Constraint Analysis

Bostwick West Community Plan Natural Environment Report, London, Ontario (Natural Environment Lead)

As an Environmental Planner, Chris was responsible for the completion of a Natural Environment Report (NER) in support of a proposed community plan for the Bostwick West planning area in London. Chris responsibilities included preparation of the NER terms of reference, consultation with municipal and UTRCA staff, coordinating the aquatic and terrestrial field investigations, and identifying environmental constraints and opportunities for future consideration during the preparation of the land use concepts, impact mitigation and environmental management strategy for future development.

Environmental Planning

Peer Review of the South West London Area Plan, London, Ontario (Environmental Planner)

On behalf of an area landowners group, Chris completed a review and assessment of the Natural Heritage Study and corresponding recommendations for the South West London Area Plan. Chris provided environmental planning advice regarding the findings and study methodology undertaken by others based on his local experience, study area conditions and current provincial and municipal natural heritage system policies.

Peer Review of the Natural Heritage System Design for the Boyne Secondary Plan, Milton, Ontario (Environmental Planner)

As input to the Milton Phase 3 Landowner Group's (MP3LG) review of the Boyne Secondary Plan, Chris was retained by a member of the MP3LG to review and evaluate the proposed Natural Heritage System Framework. Based on the natural heritage system policies of the Provincial Policy Statement and current research into the establishment of natural corridors, Chris provided environmental planning advice regarding the approach and requirements for establishing natural corridors along 16 Mile Creek.

Policy Planning

Ausable Bayfield Conservation Authority Stormwater Management Policy Update, Bayfield, Ontario (Policy Advisor)

On behalf of the Ausable Bayfield Conservation Authority (ABCA), Stantec was retained to undertake an update to their existing stormwater management (SWM) policy and guideline document. As a Policy Advisor, Chris was responsible for summarizing the evolution and current practice of SWM in terms of the approach, guidelines, policies and implementation in Ontario. This included assisting engineering staff through a review of available background studies, agency policies, SWM technologies and academic journals, consultation with various conservation authorities, municipalities and practitioners and coordination with ABCA staff to review existing policies, recommend improvements and prepare a consolidated update to their SWM policies, guidelines and targets for implementation.

Watershed Planning

Upper Strasburg Creek Class Environmental Assessment*, Kitchener, Ontario (Project Manager, GRCA)

In coordination with the Alder Creek Watershed Study and Upper Strasburg Creek Subwatershed Plan Update, a Class Environmental Assessment was completed to explore opportunities to alleviate existing flood hazards for Strasburg Creek at Fischer-Hallman Road in Kitchener. On behalf of the GRCA, Chris acted as the Project Manager to coordinate the completion and review of the Class EA through liaison with project consultants, agency staff and internal technical advisors. The results of this study were circulated for public review and presented at public information centres, the outcome of which were recorded and incorporated into the final report.

Chris J. Powell M.A.

Project Manager / Environmental Planner

Blair Creek Watershed Monitoring Program*, Cambridge / Kitchener, Ontario (Subwatershed Planning Coordinator, GRCA)

In support of GRCA's on-going monitoring responsibilities recommended as part of the Blair, Bechtel, Bauman Subwatershed Study, and as input to the Upper Blair Creek Functional Drainage Study, Chris was responsible for coordinating the aquatic habitat, water quality and fluvial geomorphological monitoring program. His duties included coordinating field staff, allocating resources, preparing an annual monitoring report, participation at public liaison meetings and general project administration for the GRCA.

Nichol Drain No. 1 Subwatershed Study*, Fergus, Ontario (Technical Advisor, GRCA)

Chris acted as a Technical Advisor and Steering Committee member representing the GRCA in support of a developer driven subwatershed study for a coldwater tributary of Irvine Creek, which was initiated in support of expanding the Town of Fergus boundaries for future residential development. His responsibilities included providing input to the terms of reference, coordinating the collection of aquatic habitat information (in-kind contribution), and reviewing draft versions of the report in regard to natural heritage and hazard land implications.

East Side Subwatersheds Studies*, Region of Waterloo, Ontario (Project Manager, GRCA)

In response to future development pressures, the Region of Waterloo in conjunction with the GRCA and area municipalities initiated the East Side Subwatersheds Study in 2005. On behalf of the GRCA, Chris acted as the Project Manager and Chair of the Steering Committee (2006-2007) and was responsible for coordinating the watershed characterization of the Hopewell, Chilligo, and Freeport Creeks and the Randall and Breslau Drains subwatersheds. His primary duty included developing and coordinating the completion of the subwatershed monitoring program, which included aquatic habitat assessments, benthic invertebrate sampling, flow monitoring, fluvial geomorphological assessments, and water quality sampling. This also included public liaison (access, agreements), consultation with RMOW, MNR and GRCA (internal) staff, coordination of field personnel and general project administration (budgets, contract administration). This project provided firsthand knowledge of the natural heritage system in the area and direct experience with the implementation of subwatershed planning and coordination as acting Subwatershed Planning Coordinator for the GRCA.

Alder Creek Watershed Study and Upper Strasburg Creek Subwatershed Plan Update*, Kitchener, Ontario (Project Manager, GRCA)

As an update to the Strasburg Creek Master Watershed Plan Study, and in response to growing development pressure along the west side of Kitchener, the GRCA, Region of Waterloo and City of Kitchener initiated a subwatershed study (SWS) to manage future growth and balance competing resource interests. This study was initiated to alleviate flooding in Strasburg Creek and to protect sensitive environmental features, groundwater recharge and municipal water supply in anticipation of future urban development.

On behalf of the GRCA, Chris acted as the Project Manager and Chair of the Steering Committee (2006-2007) responsible for the completion of the subwatershed study to characterize existing natural heritage, groundwater and hydrologic conditions within the two watersheds, identify constraints and opportunities for future development, and establish watershed policies and implementation strategy. His primary responsibility included coordinating the completion and review of the SWS report for the GRCA, including liaison with project consultants, assisting with report writing and consulting with agency staff, stakeholders, and the general public prior to formal circulation for public review. Other duties included preparation and presentation at public information centres, presentation of findings to the GRCA Board, and coordination of public and stakeholder comments based on a review of the final draft report.

PUBLICATIONS

Wetland management: An analysis of past practice and recent policy changes in Ontario. *Journal of Environmental Management v. 82:1 (83-94)*, 2007.

Sean Spisani B.Sc., ERGC

Senior Ecologist

Sean Spisani is a Senior Terrestrial Ecologist with expertise in the fields of plant community ecology, wetland science and ecological restoration. He has practiced in southern Ontario for over ten years, assuming project management roles on various projects, including environmental impact studies, environment assessments, habitat mapping, ecological management plans, and research oriented projects. Sean's client base includes municipal, provincial and federal governments, as well as private industry and land developers. He has acquired experience with a number of government and non-government organizations, including positions with Credit Valley Conservation, Rouge Park, Royal Botanical Gardens, and the Canadian International Development Agency.

Sean maintains memberships with scientific organizations, including Halton Region Ecological and Environmental Advisory Committee (2011), Society for Ecological Restoration (2001-2010), and Field Botanists of Ontario (2003-2010). He is trained in ELC protocols for Southern Ontario and certified under OWES. In 2008, Sean co-instructed his first ELC training course on behalf of the MNR. In 2006, he served as an expert witness at the Ontario Municipal Board for natural heritage matters regarding a site plan application.

Sean is a graduate of Wilfrid Laurier University with a Bachelor of Science in Biology and Physical Geography, and Niagara College with a Post-Graduate Certificate in Ecosystem Restoration. These provide a foundation to assess key biophysical components of ecological planning and management, including surficial geology, landform, hydrology, soil texture, soil moisture, vegetation cover and flora composition.

EDUCATION

B.Sc., Wilfrid Laurier University / Biology and Physical Geography, Waterloo, Ontario, 2001

ERGC, Niagara College / Ecosystem Restoration, Niagara-on-the-Lake, Ontario, 2002

Certificate, Canadian Environmental Assessment Agency / Screenings Under the Environmental Assessment Act, Ottawa, Ontario, 2011

Certificate, Canadian Environmental Assessment Agency / Orientation to the Candian Environmental Assessment Act, Ottawa, Ontario, 2011

Certificate, Link to Life / First Aid and CPR, Markham, Ontario, 2010

Certificate, Trent University / Temperate Wetland Restoration Training Course, Peterborough, Ontario, 2007

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

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC) for Southern Ontario, Peterborough, Ontario, 2004

MEMBERSHIPS

Member, Society for Ecological Restoration, Ontario Chapter

Member, Halton Region Ecological and Environmental Advisory Committee

Member, Field Botanists of Ontario

** denotes projects completed with other firms*

Sean Spisani B.Sc., ERGC

Senior Ecologist

PROJECT EXPERIENCE

Assessments, Permitting, and Compliance

York Region, 9th Line and 16th Avenue Trunk Sewer Construction Monthly Monitoring for Water Taking*, Markham, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for monitoring wetland health along dewatering influence zones during construction phase of two separate sewer lines (9th Line and 16th Avenue).

Peel Region, Credit Valley Sanitary Trunk Sewer Extension Monitoring for Water Taking*, Mississauga, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for monitoring vegetation community health during dewatering activities associated with test pumping activities and sewer construction.

York Region, Rainbow Creek Ecological Needs Assessment for PTTW*, Ontario (Ecology Lead)
Ecology lead for wetland monitoring components of PTTW in support of sewer construction.

Halton Region, Impacts to Hospital Tributary Study, Ecological Needs Assessment for Water Taking*, Georgetown, Ontario (Ecologist)
Ecologist responsible for wetland needs assessment to inform municipal water-taking requirements in proximate well fields. Groundwater sensitive feature include organic soils and calciphile flora.

Walker Brothers Quarries, Ecological Needs Assessment for PTTW*, Niagara Region, Ontario (Ecologist)
Ecologist responsible for wetland monitoring program, including eleven permanent and temporary ponds and springs. Several groundwater sensitive features were identified in the analysis area, including productive amphibian habitat and calciphile flora species.

York and Durham Regions, Southeast Collector EMP, Ecological Needs Assessment for Water Taking*, Markham and Pickering, Ontario (Lead Ecologist)
Lead ecologist responsible for wetland monitoring program to address water-taking construction requirements. The program included over 40 wetlands in York and Durham regions. Multidisciplinary approach incorporated input from the fields of wetland hydrology, soil science, and ecology.

Ecological Monitoring

Royal Botanical Gardens, Species at Risk and Sensitive Habitat Monitoring*, Hamilton, Ontario (Field Botanist)
Field botanist responsible for implementation of field monitoring for populations of the nationally endangered Scirpus verecundus and Morus rubra. Implemented prairie ecosystem management plans.

Rouge Park, ESA Inventory and Species at Risk Assessment*, Aurora, Ontario (Ecologist)
Completed forest inventory of the Little Rouge environmentally significant area and population assessments of the nationally endangered Scirpus verecundus.

Rouge Park, Forest Succession Monitoring*, Aurora, Ontario (Ecologist)
Ecologist responsible for design and implementation of terrestrial restoration monitoring protocol to track watershed-wide restoration initiatives and forest inventories.

Credit Valley Conservation, Terrestrial Monitoring Program, Credit River Watershed*, Ontario (Lead Ecologist)
Lead ecologist for collection of data according to ecological monitoring assessment network (EMAN) protocol for the watershed-wide monitoring program.

Peel Region, Credit Valley Sanitary Trunk Sewer Extension Monitoring*, Mississauga, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for monitoring vegetation community health during dewatering activities associated with test pumping activities and sewer construction.

Municipality of Clarington, Robinson and Tooley Watershed Management Plans*, Clarington, Ontario (Ecologist)
Ecologist responsible for inventory of watershed scale vegetation inventory and ELC mapping.

Niagara Region, Glenridge Naturalization Site Forest Sensitivity Study*, Ontario (Ecologist)
Monitored the effect of increased salt concentration on vegetation health associated with the former Glenridge Quarry.

** denotes projects completed with other firms*

Sean Spisani B.Sc., ERGC

Senior Ecologist

Peel Region, Assessment of Woody Vegetation on Various Landfill Sites*, Ontario (Project Manager)
Project manager responsible for five-year monitoring program to assess woody vegetation response to methane leachate on seven landfills throughout the region.

Environment Canada, Big Creek National Wildlife Area Detailed Habitat Mapping*, Port Rowan, Ontario (Project Manager)
Project manager responsible for habitat mapping of the Big Creek Marsh to inform species at risk habitat mapping initiatives.

Awenda Provincial Park Life Science Inventory*, Penetanguishene, Ontario (Ecologist)
Co-author of the Life Science Inventory for the park on behalf of the Ontario Ministry of Natural Resources. Research included over 30 days of field inventory.

Slokker Wetland Monitoring Program*, Nobleton, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for the design, implementation, and reporting of a program to track wetland function within a developing landscape.

Ecosystem, Conservation and Reclamation Planning and Design

City of Hamilton Professional and Consultant Services Roster 2011-2012 (C12-06-10); Eastern Flowering Dogwood (Cornus florida) Survey, Hamilton, Ontario (Senior Ecologist)
Conducted a flora inventory for Eastern Flowering Dogwood along the proposed East Mountain Trail Loop on an 8 ha property, to address requirements of the City of Hamilton and Hamilton Conservation Authority.

Niagara Parks Commission, Paradise Grove Restoration*, Niagara-on-the-Lake, Ontario (Ecologist)
Ecologist responsible for development of strategies to restore a 20-hectare degraded woodlot to Black Oak Savannah.

Fundacion Pro-Bosque, Habitat Rehabilitation*, Guayaquil, Ecuador (Ecologist)
Ecologist responsible for implementation of habitat rehabilitation strategies for the endangered Great Green Macaw, including the collection and interpretation of baseline data, and the development of habitat rehabilitation.

Royal Botanical Gardens Sensitive Habitat Restoration*, Hamilton, Ontario (Ecologist)
Ecologist responsible for implementation and reporting on tallgrass restoration, including the planning and communication of a prescribed burn on a 3-hectare remnant of Oak Savannah.

Yukon Construction Property Assessment*, King City, Ontario (Terrestrial Ecologist)
Terrestrial lead for monitoring of wetland and terrestrial vegetation communities pre-, during-, and post- construction of a new regional pumping station, including the development of a post-construction restoration plan.

Pretty River Academy Environmental Impact Study*, Collingwood, Ontario (Project Coordinator)
Project coordinator for the competition of an impact study to address the proposed construction of a private school complex near the Silver Creek Wetland Complex provincially significant wetland, including the design and implementation of wetland restoration plan.

Deacon Property Environmental Impact Study*, Markham, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for the production of a scoped impact study for a proposed plan of subdivision and Valley Corridor restoration plan to restore manicured portions of the Bruce Creek floodplain and valley slope to a naturalized condition and improve the ecological functions of the valley corridor.

Holy Cross Cemetery Restoration Plan*, Markham, Ontario (Ecologist)
Developed a plan to restore banks of a tributary of the Don River eroded during a large storm event in August 2005.

Kolter Property Environmental Management Plan*, Toronto, Ontario (Project Manager)
Project manager responsible for production of environmental management plan/ravine stewardship plan in support of a redevelopment plan on Bayview Avenue.

** denotes projects completed with other firms*

Sean Spisani B.Sc., ERGC

Senior Ecologist

City of Brampton, Citywide Lake Assessment*, Brampton, Ontario (Ecologist)
Ecologist responsible for terrestrial input into a citywide lake atlas and the production of a management recommendations report to document lake-specific restoration plans to improve the features and functions littoral and riparian vegetation communities.

City of Hamilton, Windermere Basin Wetland Enhancement Environmental Assessment*, Hamilton, Ontario (Ecologist)
Responsible for ecological input into wetland design, including documentation of existing conditions, planting plans, water-level operating guidelines, and stakeholder correspondence.

York Region, 16th Avenue Trunk Sewer Environmental Enhancement Initiative*, Markham, Ontario (Ecologist)
Ecologist responsible for contract administration of over 20 ecological restoration projects in York Region.

York and Durham Regions, Southeast Collector Environmental Enhancements Initiative*, Markham and Pickering, Ontario (Ecologist)
Ecologist responsible for the evaluation and design of more than 50 ecological enhancement projects, including the coordination of a government and non-government of stakeholders.

Municipality of Clarington, Robinson and Tooley Natural Heritage System*, Clarington, Ontario (Ecologist)
Ecologist responsible for landscape analysis and modeling to identify a targeted natural heritage system, within the context of future land use objectives.

Environmental Assessments

City of Toronto, Dragonboat Feasibility Study*, Toronto, Ontario (Ecologist)
Completed background review and discussions with federal, provincial, and municipal agencies to determine the viability from a fisheries perspective for the design and construction of a dragonboat racing course on the Toronto waterfront.

Halton Region, Highway 6 Widening - Highway 403 to Highway 5*, Flamborough, Ontario (Terrestrial Ecologist)
Provided vegetation and wildlife habitat inventory and assessment for the preliminary design study.

Rainbow Creek Sanitary Trunk Sewer Environmental Assessment*, York Region, Ontario (Terrestrial Ecologist)
Terrestrial lead for environmental input for Schedule C requirements of the MEA class EA process.

Town of Oakville Cornwall Road Improvements Class Environmental Assessment*, Oakville, Ontario (Terrestrial Ecologist)
Responsible for documentation of terrestrial features in the study area, including two environmentally sensitive areas, and preparation of an environmental study report and tree audit and management report.

York Region East Holland Trunk Sewer Class Environmental Assessment*, Aurora, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for inventory of the provincially significant East Aurora wetland complex, including an impact assessment for the proposed dewatering and construction of the East Holland trunk sewer.

New North Oakville Transportation Corridor Class Environmental Assessment*, Halton Region, Ontario (Terrestrial Ecologist)
Project manager for natural environment input to the Schedule C class EA, reporting as a subconsultant to the prime EA management firm.

Southeast Collector Trunk Sewer Environmental Assessment*, York and Durham Regions, Ontario (Terrestrial Ecologist)
Responsible for ELC and flora inventories for the purposes of generating a more detailed description and understanding of the environment, including the screening, analysis, and evaluation of alternatives and impact assessment.

Ministry of Transportation Ontario, New Highway Transportation Corridor Environmental Assessment*, Kitchener to Stratford, Ontario (Terrestrial Ecologist)
Ecologist responsible for coordination of natural heritage components of the individual EA.

** denotes projects completed with other firms*

Sean Spisani B.Sc., ERGC

Senior Ecologist

Ministry of Transportation Ontario, New Highway Transportation Corridor Environmental Assessment*, Brantford to Cambridge, Ontario (Terrestrial Ecologist)
Project manager responsible for natural heritage components of the transportation class EA, reporting as a subconsultant to the prime EA management firm.

SkyPower Ltd., Renewable Energy Act Records Review*, Southern Ontario (Terrestrial Ecologist)
Ecologist responsible for desktop and field review of environmental constraints under the REA for development of solar power infrastructure at various sites.

International Power, Renewable Energy Act Records Review*, Southern Ontario (Terrestrial Ecologist)
Ecologist responsible for desktop and field review of environmental constraints under the REA for development of wind power infrastructure at various sites.

NextERA, Renewable Energy Act Environmental Assessment*, Huron and Lambton Counties, Ontario (Terrestrial Ecologist)
Ecologist responsible for terrestrial components of environmental assessment study under the REA for development of wind power infrastructure.

Environmental Impact Assessments

Grovetree Road Natural Heritage Impact Study*, Toronto, Ontario (Terrestrial Ecologist)
Provided terrestrial ecology input into an environmental impact study for the proposed development of seven single detached residential dwellings and a road allowance in support of an Ontario Municipal Board (OMB) hearing on behalf of the city.

Jackson Property Environmental Impact Study*, Dunnville, Ontario (Project Manager)
Project manager responsible for the completion of an environmental impact study for a proposed single-family development along the Grand River Marsh provincially significant wetland complex.

Kinsale Property Environmental Impact Study*, Pickering, Ontario (Project Manager)
Project manager responsible for the completion of an impact study to address the proposed development of a 12-hole golf course.

Various Lake Eugenia Environmental Impact Studies*, Flesherton, Ontario (Project Coordinator)
Project coordinator of four separate lot severance and impact studies to address proposed development of single-family residences at various lake front properties along Lake Eugenia.

Lefroy Harbour Natural Area Inventory*, Innisfil, Ontario (Project Manager)
Project manager responsible for ELC, wetland delineation, and flora inventory of subject property and development of existing conditions report including a constraints analysis.

Old Mill Road Natural Heritage Impact Study*, Toronto, Ontario (Project Manager)
Project manager of an environmental impact study for the proposed development located at property along a ravine feature of the Humber River.

Marcy's Woods Environmental Impact Study*, Fort Erie, Ontario (Terrestrial Ecologist)
Terrestrial input to an environmental impact study (EIS) for the proposed development of a single residence on the subject property that includes Marcy's Woods, Point Abino provincially significant wetland, and the Point Abino environmentally sensitive area.

Huttonville Cemetery Environmental Impact Study, Credit River Watershed*, Ontario (Project Manager)
Project coordinator for the production of an environmental implementation report for a proposed cemetery in the headwaters of Huttonville Creek on behalf of the Catholic Cemeteries Archdiocese.

Sandringham Drive Natural Heritage Impact Study*, Toronto, Ontario (Project Manager)
Project manager of an environmental impact study for the proposed development located at the above noted property along a ravine feature of the Don River Valley.

Edgewood Environmental Impact Study*, Orangeville, Ontario (Terrestrial Ecologist)
Terrestrial ecologist responsible for ELC and wetland delineation in support of a plan of subdivision.

** denotes projects completed with other firms*

Sean Spisani B.Sc., ERGC

Senior Ecologist

Expert Testimony

Ontario Municipal Board, 56 Grovetree Road
Development within Ravine* (Expert Witness)
Represented City of Toronto, including preparation of Environmental Impact Study.

Ontario Municipal Board, Bloorview Children's Hospital
Development Adjacent to Ravine* (Expert Witness)
Represented private landowner, including preparation of Environmental Impact Study.

** denotes projects completed with other firms*

Sean Spisani B.Sc., ERGC

Senior Ecologist

PUBLICATIONS

Leadbeater, D. and S. Spisani. Twighlight to 2000: The Evolution of Ontario's Flora. *Presentation: Society for Ecological Restoration (Ontario Chapter) Symposium and Annual General Meeting*, 2011.

Spisani, S. and J. Cole. Robinson Creek and Tooley Creek Watershed Management Plan. *Presentation: Municipality of Clarington Open House*, 2011.

Spisani, S. and B. Valve. Natural Heritage Systems: A Systems Approach to Restoration Planning. *Presentation: Niagara College*, 2011.

Spisani, S. Southeast Collector (IEA) Environmental Management Plan: Wetland Hydrology. *Presentation: Toronto and Region Conservation Authority*, 2010.

Spisani, S. Awenda Provincial Park Life Science Inventory, Penetanguishene, Ontario. *Presentation: Field Botanists of Ontario*, 2010.

Spisani, S. Humber River Valley Restoration Plan at The Old Mill. *Presentation: Community Meeting, Toronto, Ontario*, 2009.

Spisani, S. and J. Paterson. Talus Slope Disturbance and Flora Composition: Silver Creek Area of Natural and Scientific Interest. *Presentation: Field Botanists of Ontario*, 2008.

Leadbeater, D., K. Ursic and S. Spisani. Ecological Land Classification Certification Course. *Presentation: Ontario Ministry of Natural Resources*, 2008.

Spisani, S. Southeast Collector (IEA) Ecological Enhancement Workshop: Designing a Natural Heritage Systems Approach. *Presentation: Toronto and Region Conservation Authority*, 2008.

Nicole Charlton B.A.

Botanist / Terrestrial Ecologist

Nicole Charlton is a terrestrial ecologist whose primary expertise is in field botany, with particular experience in conducting floral inventories, Ecological Land Classification (ELC), and terrestrial vegetation monitoring. She has also assisted on a wide variety of wildlife surveys, including amphibian monitoring, anuran call counts, reptile and mammal surveys, and bird and bat mortality studies. Nicole has technical experience in both the public and private sectors, and has experience working on a wide variety of projects, including invasive species control and land stewardship, ecological monitoring, various Species at Risk (SAR) surveys, surveys for renewable energy (wind) development planning and monitoring, in addition to other types of development projects.

EDUCATION

B.A., University of Guelph / Geography, Guelph, Ontario, 2010

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Lindsay, Ontario, 2011

Stantec Consulting Ltd. / WHMIS Training, Guelph, Ontario, 2011

PROJECT EXPERIENCE

Cement / Aggregates

Proposed Melancthon Quarry, The Highland Companies, Melancthon, Ontario (Terrestrial Ecologist)
Assisted with electrofishing and habitat assessment studies in support of the natural heritage technical report

Proposed Flamborough Quarry, Flamborough, Ontario (Terrestrial Ecologist)
Assisted with Butternut Health Assessment on subject lands in support of the natural heritage technical report

Walker Aggregates Inc. Duntroon Quarry Expansion, Duntroon, Ontario (Terrestrial Ecologist)
Assisted with monitoring sensitive species populations (American Hart's-tongue Fern), in support of the natural heritage technical report

Natural Sciences & Heritage Resources

Ecological Surveys for Various Residential Developments, Ontario (Terrestrial Ecologist)
Assisted on various ecological surveys in support of development applications, including anuran monitoring, ELC, and floral inventories

Terrestrial Vegetation Monitoring, Credit Valley Conservation*, Mississauga, Ontario (Terrestrial Monitoring Crew Leader)
Led a team and carried out vegetation monitoring according to EMAN and Credit Valley Conservation protocols in riparian, wetland, and forest habitats, as well as an in-house tree health component. Work included multi-season systematic inventory and identification of vegetation species in permanent plots at sites throughout the Credit River watershed

Natural Heritage Conservation, Credit Valley Conservation*, Ontario (Natural Heritage Assistant)
Performed a variety of tasks related to natural heritage conservation, including ELC; native seed collection and plant propagation as part of the restoration of the Rattray Marsh forest communities; field trials of invasive species control methods for common buckthorn and garlic mustard, as well as landowner liaison regarding invasive species and land stewardship issues; assisted with writing various reports and in-house research material

Invasive Species Control, Asian Long-horned Beetle Taskforce, Canadian Food Inspection Agency*, Greater Toronto Area (GTA), Ontario (Plant Protection Inspector)
Systematically inspected host tree genera across the regulated portion of the GTA for evidence of infestation by Asian Long-horned Beetle

** denotes projects completed with other firms*

Nicole Charlton B.A.

Botanist / Terrestrial Ecologist

Renewable Energy

Wind Energy Projects, Various Sites, Ontario (Terrestrial Ecologist)

Conducted ELC, amphibian, reptile, raptor, and Short-eared Owl surveys, post-construction monitoring, and assisted with technical reporting for various wind energy projects, including Wolfe Island Wind Farm, Amherst Island Wind Farm, White Pines Wind Farm, Niagara Region Wind Centre, Kingsbridge Wind Farm, Grand Renewable Energy Project

** denotes projects completed with other firms*

Angela M Ducharme B.Sc., EPt

Environmental Scientist

Angela is an Environmental Scientist focusing on the hydrogeological sector of Stantec's Environmental Management group. Her project experience is diverse, ranging from the completion of hydrogeological studies to ecology-based projects, including all aspects of project completion from fieldwork to project management. She has experience in hydrogeological studies, phased environmental site assessments (ESAs), wetland studies, ecological assessments, designated substance surveys, and indoor air quality. Her field skills include soil logging, mini-piezometer installations, water level monitoring using manual measurements and dataloggers, slug and pumping tests, collection of soil, groundwater, and surface water samples, stream flow monitoring and detailed assessments using the Ontario Stream Assessment Protocol, backpack electrofishing, benthic community sampling, ecological land classification (ELC), designated substance building surveys and sample collection, and indoor air quality monitoring.

Angela's educational background provides her with an excellent background in hydrogeological processes and field techniques with respect to soil and water sampling and analysis.

EDUCATION

B.Sc., Honours Biological Science, University of Guelph, Guelph, Ontario, 2007

Environmental Engineering Applications (Post-Graduate), Conestoga College, Kitchener, Ontario, 2008

REGISTRATIONS

Environmental Professional In Training (EPt), Canadian Environmental Certification Approvals Board

PROJECT EXPERIENCE

Ecological Monitoring

Stream Assessments within the Bronte Creek Watershed*, Milton/Burlington, Ontario (Field Technician)

Angela has completed numerous stream assessments using the OSAP protocol, as well as benthic community sampling and fish community sampling by backpack electrofishing.

Terrestrial Habitat Assessments using ELC, southern Ontario* (Environmental Scientist)

Angela has completed vegetation community assessments using the ELC method for various different clients, from large-scale permitting projects to smaller assessments for municipal trail planning within parks.

Environmental Site Assessments Phase I, II, III

Record of Site Condition and Remediation Assessments*, Southern Ontario (Environmental Scientist)

Angela has worked on various phased ESA projects within southern Ontario. Angela's responsibilities have included site reconnaissance and reporting for Phase I ESAs, supervision of borehole drilling and collection of soil samples, groundwater sampling, remediation monitoring on both light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPL) sites, analysis and reporting.

Hazardous Materials Management

Designated Substance Surveys, various locations across Canada* (Environmental Scientist)

Angela has completed designated substance building surveys of over 200 properties in various provinces across Canada. Her main responsibilities have included project coordination, building inspections and sample collection, and reporting.

Hydrogeologic Assessments

Residential Well Monitoring for PTTW, Southern Ontario (Environmental Scientist)

Residential surveys and water quality sampling in support of various PTTW for groundwater dewatering projects. Angela was responsible for monitoring program coordination, landowner interviews, water sample collection, and reporting.

** denotes projects completed with other firms*

Angela M Ducharme B.Sc., EPt

Environmental Scientist

Permit to Take Water (PTTW) Applications, Southern Ontario (Environmental Scientist)

Reporting for various Category 2 and 3 PTTW applications in support of a large-scale monitoring program, involving trenching to inspect a major natural gas pipeline. Angela was responsible for preparing dewatering calculations for excavation purposes using regional and site-specific stratigraphy data, MOE Water Well Records, and field observational data. She also completed various reporting activities in support of the PTTW applications.

Hydrogeological Assessment, Orangeville Wetland Complex*, Orangeville, Ontario (Environmental Scientist)

Existing hydrogeological conditions of a provincially significant wetland (PSW) and creek were investigated to evaluate the potential for impact to the wetland complex from the existing and future discharge of municipal wastewater to a creek flowing through the centre of the wetland. The assessment focused on determining hydraulic relationships between the shallow groundwater system, wetland areas, and creek water. As the lead project scientist, Angela was responsible for project coordination, installation of drive-point piezometers, hydraulic gradient monitoring using manual measurements and dataloggers, sampling of groundwater and surface water, analysis and reporting. Angela also assisted with the completion of ELC assessments of vegetation communities for the project.

Hydrogeologic Assessment*, Pickering, Ontario (Environmental Scientist)

Angela was the principal investigator in the completion of a hydrogeologic assessment in support of a land zoning change application in an area on the fringe of the Oak Ridges Moraine. The investigation included the installation of a private well to determine the water table depth and site stratigraphy, and the completion of a pumping test while monitoring nearby private residential wells. Angela was responsible for completing well owner interviews, completing a stepwise pumping test, and analyzing hydraulic test data from both dataloggers and manual measurements.

Indoor Air Quality Assessment

IAQ Surveys* (Environmental Scientist)

A large-scale IAQ monitoring project for numerous federal government buildings was conducted in accordance with Occupational Health and Safety Regulations. Angela assisted with IAQ monitoring activities at various buildings, as well as data analysis and reporting.

Training and Education

Ecological Land Classification (ELC) Training Course for Southern Ontario – Ontario Ministry of Natural Resources (MNR)*

40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) – Conestoga College*

Backpack Electrofishing Crew Leader (Class II) – MNR*

Ontario Stream Assessment Protocol (OSAP) – MNR*

Asbestos Hazard Emergency Response Act (AHERA) Building Inspector, United States Environmental Protection Agency (U.S. EPA)*

First Aid & CPR (Level C) – Canadian Red Cross*

Fall Protection Awareness Training – Acute Environmental & Safety Services*

Scissor Lift Awareness Training – Acute Environmental & Safety Services*

Confined Space Awareness Training – Safetyscope Inc.*

** denotes projects completed with other firms*

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

Ecologist

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

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

EDUCATION

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

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

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

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

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

MEMBERSHIPS

Member, Field Botanists of Ontario

Member, Ontario Field Ornithologists

Member, Bird Studies Canada

PROJECT EXPERIENCE

Commercial / Retail Development

Various Commercial Development Projects*, Ontario (Biologist)

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

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

Highway and Transportation

Various Highway and Transportation Projects*, Ontario (Biologist)

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

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

** denotes projects completed with other firms*

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

Industrial Development

Various Industrial Development Projects*, Ontario (Biologist)

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

Linear Infrastructure

Various Servicing Projects*, Ontario (Biologist)

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

Natural Sciences & Heritage Resources

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

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

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

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

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

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

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

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

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

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

** denotes projects completed with other firms*

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

Ecologist

Residential Development

Various Residential Development Projects*, Ontario (Biologist)

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

** denotes projects completed with other firms*

James Heslop

Bird Surveyor

James Heslop has thirty (30) years experience birding and record-keeping experience. He has volunteered with the Audubon Christmas Bird Censuses in Pickering, Hamilton, Fisherville, St. Catharines, and 25 years at Long Point. James was a volunteer for the Ontario Breeding Bird Atlas from 1981 to 1985, and from 2001 to 2005 (including point counts). He has also been involved with Ontario Forest Bird Monitoring of the Dundas Valley, was past recording secretary of the Norfolk Field Naturalists (NFN), past president of the Pickering Field Naturalists (PFN), was a Founding Member and is a Life Member of the Ontario Field Ornithologists (OFO), was the past lead editor of OFO News, past publicity director of the Hamilton Naturlaists' Club (HNC), is the current treasurer of the HNC, is the leader of field outings for the NFN, PFN, HNC and OFO, and is a current member of Hamilton Waterfront Trust Eastport Drive Trail Project Advisory Group.

EDUCATION

Birding Courses, Sheridan College, Ontario, 1980

Commerce and Finance, University of Toronto, Ontario, 1972

PROJECT EXPERIENCE

Environmental Management
Migratory and Breeding Bird Surveys*
Migratory and breeding bird surveys for Positive Power Cooperative Inc, Dougan and Associates, Trow Associates

Field Surveys*
Study of hooded warblers, acadian flycatchers and invasive plants for Bird Studies Canada

Bird Strike Surveys*, Burlington Beach, Ontario (Bird Surveying and Monitoring)
Environment Canada

** denotes projects completed with other firms*

Brandon Holden

Environmental Scientist

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

EDUCATION

Lambton College, Sarnia, Ontario, 2007

PROFESSIONAL ASSOCIATIONS

Voting Member, Ontario Bird Record Committee (OBRC)

Member, Bird Studies Canada

Member, Ontario Field Ornithologists

Member, American Birding Association

AWARDS

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

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

Ross Thompson Trophy for Proficiency in Ornithology - 2004

Doug Tarry Young Ornithologist Award - 2002

Hamilton Civic Award - 2002

Ross Thompson Trophy for Proficiency in Ornithology - 2002

PROJECT EXPERIENCE

Research

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

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

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

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

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

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

Brandon Holden

Environmental Scientist

Sports, Recreation & Leisure

Volunteer Work, Multiple Locations* (Volunteer)

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

Peregrine Prints, Multiple Locations* (Photographer)

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

Emergency Planning / Response

Emergency Medical Care Training, Multiple Locations*

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

** denotes projects completed with other firms*

Heather J. Hughes B.Sc. Env.

Ecologist

Heather Hughes is an ecologist with experience in plant and wildlife ecology. She has experience in flora, fish, tracks, birds, mammals, reptiles, and benthic macro invertebrate identification, and is familiar with OBBN standards for auto-level and total station surveys and sampling. Heather has conducted amphibian (frog) call surveys in accord with BSC protocols. In addition, Heather has conducted surveys for Species at Risk in Ontario, including bat, and reptile (snake) surveys.

Heather has provided technical support on contract to Stantec Consulting at various project sites in Ontario, involving in-field data collection in support of several of our projects, including wind farm planning, aggregate extraction, and post-construction monitoring projects. A brief summary of her recent projects is listed below.

EDUCATION

B.Sc. Env., University of Guelph / Environmental Science, Guelph, Ontario, 2010

Graduate Certificate, Niagara College / Ecosystem Restoration Post-grad, Niagara-on-the-Lake, Ontario, 2012

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Grand Valley Wind Farm Post-construction Monitoring, Grand Valley, Ontario (2012) (Field Ecologist)
Conducted bi-weekly surveys around turbines searching for turbine related fatalities; collected, identified, and documented finds. Set-up additional monthly scavenger trials to ascertain if, and how many, fatalities were being scavenged before surveys could be completed

Niagara Region Wind Centre, Niagara Peninsula, Ontario (2012) (Field Ecologist)
Conducted field surveys, including amphibian call counts

Walker Industries Holdings Uppers Lane Quarry, Niagara Falls, Ontario (2012) (Field Ecologist)
Performed multiple rounds of snake coverboard surveys; identified and recorded any snakes found

Grand River Conservation Authority (GRCA) Laurel Creek Nature Centre, Waterloo, Ontario*(2008-2012) (Ecologist)
Led environmental programs for public and school groups, adapting the program to visitors' ages. Organized and led the Ducks Unlimited Project Webfoot program for school groups in Grand Erie and Waterloo Region school board districts. Created educational programs and games and taught students about wetland preservation and habitat preservation, per curricula. Performed some administrative duties

** denotes projects completed with other firms*

Natalie A. Leava M.Sc.

Terrestrial Ecologist

Natalie Leava is a terrestrial ecologist whose practical skills include the identification of grasses, flowering plants, trees, lichens, and bryophytes. She is certified in Ecological Land Classification (ELC) and the Ontario Wetland Evaluation System (OWES). She has performed ELC mapping at various development sites, as well as executed wetland evaluations and delineations. Natalie is familiar with habitat identification and classification, ecological surveying and conservation assessment. She is familiar with the identification of bats, aquatic invertebrates and *Carabidae*, reptiles, and amphibians and has participated in amphibian surveys. Natalie possesses laboratory and technical skills that include surveying techniques, soil sampling, isotopic analysis, water sampling, sediment coring and geochemistry lab analysis. Natalie is familiar with GIS and Remote Sensing techniques for mapping ecological features using ArcVIEW and ER Mapper software. Her undergraduate degree included a minor in psychology, and her experiences through work, education and volunteering have equipped Natalie with an ability to communicate effectively with regulatory authorities and the general public.

EDUCATION

M.Sc., Applied, University College Cork / Ecological Assessment, Cork, Republic of Ireland, 2010

B.Sc., Honours, McMaster University / Earth and Environmental Sciences, Hamilton, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC), Lindsay, Ontario, 2011

WHMIS Training Course, Guelph, Ontario, 2011

Boating License & Pleasure Craft Operator, Rosseau, Ontario, 2008

Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System, North Bay, Ontario, 2012

PROJECT EXPERIENCE

Education

University College Cork, Environmental & Civil Engineering Department Hydromet Lab*, Cork, Republic of Ireland (Part-time Research Assistant)

Research included forest inventory, destructive tree sampling, biomass pools, fine root analysis, chemical analysis, and soil analysis, to compare net ecosystem balances of an improved grassland with a newly afforested grassland. Proposed research projects to supplement and complement existing eddy covariance data. Executed all associated field and lab work

McMaster University Graduate Student Assistance*, Hamilton, Ontario (Volunteer Assistant)

Assisted Masters student in construction of wood stands for eavestroughs to be used in a forested ecosystem to induce drought. Involved Hydro-Meteorological Lab work at McMaster University, and fieldwork at Turkey Point, Ontario

Natural Sciences & Heritage Resources

Various Species at Risk Habitat Surveys for Transportation Projects, Ministry of Transportation, Sudbury, Simcoe, Cambridge and Chatham, Ontario (Terrestrial Ecologist)

Performed habitat surveys for Queen Snake, Bobolink, Blanding's Turtle

Activa Waterloo East Lands, Kitchener, Ontario (Terrestrial Ecologist)

Responsible for annual photomonitoring, preparation of photolog and reporting. Prepared ecological update on overall health of study area based on monitoring 'during construction'

** denotes projects completed with other firms*

Natalie A. Leava M.Sc.

Terrestrial Ecologist

Proposed Melancthon Quarry, The Highland Companies, Melancthon, Ontario (Terrestrial Ecologist)
Field ecologist and field work coordination assistance. Compilation of field work records filed since project initiation

Environmental Consulting Firm in Ontario, Canada* (Junior Botanist)
Assisted and trained under senior biologist. Completed data entry for vegetative species list and ELC mapping. Participated in species at risk surveys and compensation programs

Lake Simcoe Region Conservation Authority*, Newmarket, Ontario (Full-time Stewardship Assistant)
Interacted with homeowners in Simcoe Region to promote source water protection and provide public information regarding government funding programs available. Prepared and distributed information packages to homeowners

Renewable Energy

Cedar Point Wind Project, Municipality of Lambton Shores (Forrest), Ontario (Terrestrial Ecologist)
Field ecologist and assisted with preparation of technical NHA report. Performed ELC, vegetation surveys and mapping. Field work coordination assistance provided to Terrestrial Lead

Sydenham Wind Energy Centre, Lambton County and Municipality of Chatham-Kent, Ontario (Terrestrial Ecologist)
Contributed to composition of tables and figures for NHA report

Adelaide Wind Power Project, Melancthon, Ontario (Terrestrial Ecologist)
Field ecologist and field work coordination assistance. Compilation of field work records completed for project from 2004 onward

Niagara Region Wind Centre, Niagara Peninsula, Ontario (Terrestrial Ecologist)
Field technician and field work coordination assistance. ELC and vegetation field work, winter raptor surveys and general habitat assessments. Prepared field packages and assisted with delineation of areas requiring field work

KEPA Wind Energy Project Post-construction Monitoring, Kruger Wind Energy Chatham LP, Port Alma, Ontario (Terrestrial Ecologist)
Responsible for conducting monthly searcher efficiency trials. Weekly mortality results entered and identified

Dorland Wind Energy Project, Gilead Power Corp., Dorland, Ontario (Terrestrial Ecologist)
Written report components including background data collection and records review. Data entry and data results

** denotes projects completed with other firms*

Natalie A. Leava M.Sc.

Terrestrial Ecologist

PUBLICATIONS

Leava, N.A. A Baseline Ecological Assessment for Castlefreke, Co. Cork. *M.Sc. Thesis, University College Cork, Cork, Republic of Ireland*, 2010.

Peichl, M., N. Leava, and G. Kiely. Above and below ground ecosystem biomass, carbon and nitrogen allocation in a recently afforested grassland and adjacent intensively managed grassland. *Plant and Soil*, 2010.

Leava, N.A. Bioremediation of Heavy Metal Leachate in Contaminated Oligotrophic Aquifers. *B.Sc. Term Paper. McMaster University, Hamilton, Ontario, Canada*, 2009.

Leava, N. Fractionation of Sulfur Isotopes within Microbial Processes. *B.Sc. Term Paper and Presentation. McMaster University, Hamilton, Ontario, Canada*, 2008.

Leava, N. PAH Contamination of Soils and Remedial Process Available within North America. *B.Sc. Thesis Paper and Presentation. McMaster University, Hamilton, Ontario, Canada*, 2008.

James Leslie B.E.S.

Terrestrial Ecologist

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

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

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

EDUCATION

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

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

Certificate, Butternut Health Assessment, Burlington, Ontario, 2009

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

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

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

MEMBERSHIPS

Member, Botanical Society of America

Member, Field Botanists of Ontario

PROJECT EXPERIENCE

Aggregate Services

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

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

Proposed Flamborough Quarry, Hamilton, Ontario (Ecologist)

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

James Leslie B.E.S.

Terrestrial Ecologist

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

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

Environmental Mitigation and Monitoring

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

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

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

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

Oil & Gas

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

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

Power Transmission & Distribution

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

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

Renewable Energy

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

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

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

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

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

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

Terrestrial Assessments

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

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

** denotes projects completed with other firms*

James Leslie B.E.S.

Terrestrial Ecologist

Transportation Planning

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

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

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

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

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

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

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

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

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

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

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

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

** denotes projects completed with other firms*

James Leslie B.E.S.

Terrestrial Ecologist

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

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

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

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

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

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

** denotes projects completed with other firms*

Andrea E. McCreery B.E.S., M.Sc.

Environmental Planner

Andrea McCreery has 3 years of experience in land use and environmental resources planning and management. Andrea is responsible for planning and coordinating environmental impact assessments, natural environment field programs and biological inventories in support of development, transportation and watershed restoration projects. Andrea has been involved in the implementation of the natural heritage and natural hazards policies of the Provincial Policy Statement, Conservation Authorities Regulations and Municipal planning documents. Andrea has developed a thorough understanding of the complex and evolving policy framework in the Province and a comprehensive understanding of the interconnections between the physical and the natural environment, and maintains a good working relationship with the review and approval agencies.

Formerly with the St. Clair Region Conservation Authority, she developed an extensive working knowledge of watershed management, environmental assessment and natural resources planning through input into the development of SCRCA policies, public consultation and coordinating the review and approval of development applications, permits and Environmental Assessments.

EDUCATION

Bachelor of Environmental Studies, University of Waterloo, Waterloo, Ontario, 2008

Master of Science, Rural Planning and Development, University of Guelph, Guelph, Ontario, 2011

School of Environmental Design and Rural Development Program Evaluation Certificate, University of Guelph, Guelph, Ontario, 2011

PROJECT EXPERIENCE

Environmental Planning

Dorchester South Stormwater Drainage Area Class Environmental Assessment, Dorchester, Ontario (Environmental Planner)

Environmental Planner responsible for updating the Natural Environment Report (NER) by performing an environmental constraints analysis for the subject lands, using published resources and field investigations provided by technical staff to identify constraints to development. A Class EA in progress will consider the proposed alternatives of development, the potential environmental impacts and discuss mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members.

Upper Little River Stormwater and Master Drainage Plan, Ontario (Environmental Planner)

Responsible for the completion of a Natural Heritage Study to recommend measures to protect the natural features and functions in the area. The Natural Heritage Study considers the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members.

Niagara Region Wind Project, Ontario (Environmental Planner)

Performed a preliminary environmental constraints analysis for the subject lands, using published resources and consultation with government agencies to identify constraints to development. Preparation of this report required the active involvement with other study team members.

Sunningdale Court Scoped Environmental Impact Study, London, Ontario (Environmental Planner)

Responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area. Currently in progress, this EIS will consider the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members.

Andrea E. McCreery B.E.S., M.Sc.

Environmental Planner

Beachville Trail Component of the Thames Valley Trail System, Environmental Assessment, County of Oxford (Environmental Planner)
Performed a preliminary environmental constraints analysis for the subject lands, using published resources to identify constraints to development. Preparation of this report required the active involvement with other study team members.

Pine Street Subdivision Environmental Impact Study, Ingersoll, Ontario (Environmental Planner)
Responsible for the completion of an Environmental Impact Study to recommend measures to protect the natural features and functions in the area. An EIS currently in progress will consider the proposed plan of development, the potential environmental impacts and discussed mitigation measures for each potential impact. Preparation of this report required the coordination of technical staff and active involvement with other study team members.

Hamilton Road Natural Environment Report, London, Ontario (Environmental Planner)
Environmental Planner responsible for updating to the report by performing an environmental constraints analysis for the subject lands, using published resources and field investigations provided by technical staff to identify constraints to development.

Policy Planning

County Aggregate Resource Strategy, Huron County Planning Department* (Junior Planner)
In response to Provincial direction, the planning department initiated a process to develop a strategy to manage mineral aggregate resources in Huron County. Andrea was responsible for the completion of a strategy report to recommend policy measures that balance ecologic objectives, extraction, and long-term protection of aggregate resources. This strategy report required the coordination of a steering committee, collaboration with external stakeholders and active involvement with other planners.

Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourse Regulation, Ontario Regulation 171/06, St. Clair Region Conservation Authority* (Regulations & GIS Technician)
Acting as Regulations & GIS Technician, Andrea organized a set of draft policies based on existing provincial and regional legislation. The purpose of the document was to provide the public with a user-friendly guide to SCRCA policies. This document required the active involvement with other study team members.

Provincial Policy Statement Five Year Review, Middlesex County Planning Department* (Policy Planner)
The Province conducted a review of the PPS requesting input from a variety of agencies and departments in Ontario. Andrea was responsible for participating in agency consultation, identifying inconsistencies, and providing an evaluation of the document's ability to adequately address emerging land issues. Upon approval from County Council, the completed evaluation was submitted to the Province for review.

Middlesex County Industrial, Commercial and Residential Vacant Lands Inventory* (Planner)
Andrea conducted an inventory of all vacant industrial, commercial and residential lands within Middlesex County to provide recommendations for the County five year review. Recommendations were based on the vacant land findings and potential future development scenarios. The completed report required a GIS catalog of vacant lands, accurate estimation of projected lots and lot sizes (based on existing designs, zoning bylaws and natural heritage features and hazards), and estimated population growth. In addition to the report, Andrea presented the study findings with policy recommendations to support development growth.

Reporting

Middlesex County Municipal Water and Wastewater Infrastructure Report* (Planner)

Elgin County Local Food Study, University of Guelph* (Project Assistant)

Managing Water Resources in Ontario: A comparative study of Ontario and Australian Water Policies*

** denotes projects completed with other firms*

Andrea E. McCreery B.E.S., M.Sc.

Environmental Planner

Greenhouse Gas Emissions Reduction Strategy*,
University of Guelph, Guelph (Project Developer)

** denotes projects completed with other firms*

Brian M. Miller Tech. Dipl.

Botanist / Terrestrial Ecologist

Brian Miller serves as a Botanist and Terrestrial Ecologist whose academic background encompasses various aspects of natural resource management, with a focus on vascular plant identification and vegetation community assessment. Brian has extensive field experience conducting detailed botanical inventories of plant communities throughout southern Ontario, which has provided him with an advanced knowledge of southern Ontario's vascular flora. For over 6 years, Brian has participated in numerous surveys of species at risk (SAR) and other significant plant species, as well as wetland boundary delineations.

Brian's field experience in avian and amphibian identification through sight and sound and their associated habitats complements his botanical expertise. He is familiar with the Natural Heritage Information Centre (NHIC) species databases, and is experienced at the application of principles and guidelines of the Significant Wildlife Habitat Technical Guide, the *Endangered Species Act*, the *Migratory Birds Convention Act* and other applicable federal, provincial and municipal legislation.

EDUCATION

Tech. Dipl., Sault College / Fish and Wildlife Technician (Honours), Sault Ste. Marie, Ontario, 2006

Certificate, University of Guelph / Classification and Morphology of Seed Plants, Guelph, Ontario, 2007

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC) for Southern Ontario, Lindsay, Ontario, 2008

Royal Botanical Gardens / Woodland Sedge Identification Workshop, Burlington, Ontario, 2009

Certificate, Ontario Ministry of Natural Resources / Butternut Health Assessor, Hamilton, Ontario, 2009

Field Botanists of Ontario / Spring Hawthorn Identification Workshop, Middlesex County, Ontario, 2010

Toronto and Region Conservation Authority / Carex Sedge Identification Workshop, Toronto, Ontario, 2011

Certified Arborist, International Society of Arboriculture, Guelph, Ontario, 2012

PROJECT EXPERIENCE

Endangered Species/Species at Risk Assessments

Union Gas Easements, Windsor, Ontario (Botanist)
Conducted detailed botanical inventories and mapped numerous SAR and provincially rare species in gas line easements

Enbridge Pipeline Integrity Digs, Thorold and Hamilton, Ontario (Botanist)
Conducted butternut health assessments and SAR surveys within pipeline easements

Windsor Essex Parkway*, Windsor, Ontario (Botanist)
Conducted detailed botanical inventories of SAR-rich remnant prairie sites. Numerous SAR were flagged and mapped using handheld GPS

Highway 407 Extension*, Durham Region (Botanist)
Conducted regionally rare /significant plant species surveys and GPS mapping along new Highway route

Shell Canada Proposed Heavy Oil Refinery Expansion Project*, Lambton County, Ontario (Botanist)
Conducted ELC surveys and GPS mapping of provincially and regionally significant species and vegetation communities

** denotes projects completed with other firms*

Brian M. Miller Tech. Dipl.

Botanist / Terrestrial Ecologist

CPA Subwatershed Study*, Township of Centre Wellington, Ontario (Botanist)
Conducted comprehensive biological inventories of vascular flora, vegetation communities, breeding birds, snakes and calling anurans as part of Phase 1 (Existing Conditions) of the subwatershed study. All species of regional and provincial significance were mapped

Mill Pond Park Biological Inventory*, Town of Richmond Hill, Ontario (Botanist)
Conducted detailed biological inventory of vascular flora, vegetation communities and breeding birds for proposed trail improvements. Prepared 64 page 'Ecological Land Classification (ELC) Assessment and Breeding Bird Survey of Mill Pond Park' technical report with appendices and ELC map (Aboud & Associates Inc., 2010)

Block 11 Wetland Vegetation Monitoring*, Vaughan, Ontario (Botanist)
Set-up and conducted wetland vegetation monitoring in two wetlands adjacent to a proposed subdivision

Natural Sciences & Heritage Resources

Hydro One Inc., Proposed Clarington Transformer Station, Durham Region, Ontario (Botanist)
Performed detailed botanical inventory and ELC mapping

Cambridge Hydro North Dumfries at Speed River, North Dumfries, Ontario (Botanist)
Performed detailed botanical inventory and ELC mapping

Enbridge Pipelines Inc., Lines 10 and 11, Thorold and Hamilton, Ontario (Botanist)
Performed Butternut Health Assessments (SAR)

Grand Renewable Energy Park, Haldimand County, Ontario (Botanist)
Performed numerous wetland boundary delineations and mapping

Fairway/Lackner Lands, Kitchener, Ontario (Botanist)
Performed detailed botanical inventory, ELC mapping, and wetland boundary delineation

Detailed Design Services for Leslie Street Realignment, York Region, Ontario (Botanist)
Performed detailed botanical inventory and ELC mapping

Canadian Pacific Site-specific Ecological Risk Assessment, Pointe au Baril Derailment Site, Parry Sound District, Ontario (Botanist)
Performed detailed botanical inventory and herpetofaunal SAR survey

Union Gas Panhandle Replacement, Ojibway Prairie Complex, Windsor, Ontario (Botanist)
Performed detailed botanical inventory and SAR mapping along pipeline corridor

Marigold Homes North Dorchester Servicing Study and EIS, Middlesex County, Ontario (Botanist)
Performed detailed botanical inventory and ELC mapping

Niagara Region Wind Centre, Niagara Peninsula, Ontario (Botanist)
Performed roadside ELC assessment along transmission line route

Walker Industries Holdings, Uppers Lane Quarry, Niagara Falls, Ontario (Botanist)
Performed fall hawthorn (Crataegus sp.) survey and botanical inventory

Suncor Energy, Cedar Point Wind Project, Lambton County, Ontario (Botanist)
Performed detailed botanical inventory and ELC mapping

Grand Valley 3 Wind Project, Dufferin County, Ontario (Botanist)
Performed roadside ELC assessment

Sunningdale Golf and Country Club, Hole Relocation EIS, London, Ontario (Botanist)
Performed detailed botanical inventory, ELC mapping, and SAR surveys

** denotes projects completed with other firms*

Brian M. Miller Tech. Dipl.
Botanist / Terrestrial Ecologist

PUBLICATIONS

Miller, Brian M. Sparrow Lake Aquatics Trip Report, Muskoka. *Field Botanists of Ontario (FBO) Newsletter 24(1)*, 2012.

Miller, Brian M. Five Points Forest Trip Report, Ingersoll (June 6th, 2010). *Field Botanists of Ontario (FBO) Newsletter 23(1)*, 2011.

Miller, Brian M., Robert J. Aitken, Michael J. Oldham, and Anton A. Reznicek. Slender False Brome (*Brachypodium sylvaticum, Poacea*), an invasive grass new to Ontario, Canada. *Canadian Field Naturalist 125(3): 235-240*, 2011.

Cheryl-Anne L. Ross B.Sc., Tech. Dipl.

Terrestrial Ecologist

Cheryl-Anne Ross is a terrestrial ecologist whose skills include bird, mammal, herpetile, and plant identification, with technical experience in both the public and private sectors. Cheryl-Anne is certified in Ecological Land Classification (ELC). She is adept at conducting a variety of wildlife and wildlife habitat surveys, and has been involved development projects in various sectors, including renewable energy (wind) planning, residential, and industrial construction.

EDUCATION

B.Sc., University of Northern British Columbia / Natural Resources and Environmental Management, Wildlife and Fisheries, Prince George, British Columbia, 2007

Tech. Dipl., Sir Sandford Fleming College / Fish and Wildlife Technologist, Lindsay, Ontario, 2004

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC), Lindsay, Ontario, 2011

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Various Development Projects*, Ontario (Terrestrial Ecologist & Wetland Biologist)

Conducted biological field surveys and associated data management and analysis for various developments throughout Ontario, including renewable energy projects. Included were breeding bird surveys, nest searches, amphibian counts, SAR salamander population monitoring, wind farm mortality monitoring, bat species and abundance monitoring, and wetland evaluation. Also involved associated background research and reporting

NOVA Chemicals Genesis Pipeline Extension, Corunna, Ontario (Terrestrial Ecologist)

Conducted SAR surveys and habitat assessments, including reptile (snake) coverboard surveys and amphibian (frog) call count surveys

Amherst Island Wind Farm, Amherst Island, Ontario (Terrestrial Ecologist)

Conducted winter raptor, staging waterfowl, and SAR surveys; provided assistance with technical reporting and data entry

Waterloo Westside, Vista Hills, Clair Creek Meadows, Waterloo, Ontario (Terrestrial Ecologist)

Conducted an assessment of silt fence integrity and photo-monitoring; assessed impacts of deleterious substance release

NOVA 2020 Plant Expansion, Corunna, Ontario (Terrestrial Ecologist)

Conducted SAR surveys and habitat assessments, including reptile (snake) coverboard and amphibian (frog) call count surveys

Cedar Point Wind Farm, Forest, Ontario (Terrestrial Ecologist)

Conducted habitat assessment, ELC, SAR surveys including reptile (snake) coverboard surveys

Niagara Region Wind Centre, Niagara Peninsula, Ontario (Terrestrial Ecologist)

Conducted habitat assessment, ELC, amphibian surveys, winter raptor surveys, and SAR surveys; aided with coordination of field studies and assisted with technical reporting for the Natural Heritage Assessment

Bow Lake Wind Farm, Montreal River Harbour, Ontario (Terrestrial Ecologist)

Conducted habitat assessment, amphibian surveys, and SAR surveys; aided in coordination of field studies and assisted with technical reporting for the Natural Heritage Assessment

** denotes projects completed with other firms*

Matthew Ross B.Sc.

Ecologist

Matthew Ross is an ecologist whose skills include bird, mammal, reptile and plant identification. He is adept at conducting wildlife and wildlife habitat surveys, including those that relate to environmental assessment, conservation and species at risk. Matthew is familiar with provincial and federal guidlines, including Ontario Wetland Evaluation System (OWES), Ecological Land Classification (ELC) and Renewable Energy Approvals (REA). He has conducted surveys for a variety of development projects, including renewable energy, aggregate extraction and residential, and has work experience in both the public and private sector. In addition, Matthew is familiar with wildlife handling, including bird banding and migration monitoring at Selkirk Provincial Park. He has performed native tree species plantings and been involved in exotic plant control efforts as a volunteer at Florida Panther National Wildlife Refuge.

EDUCATION

B.Sc., University of Northern British Columbia / Natural Resources Management Wildlife and Fisheries, Prince George, British Columbia, 2007

Sir Sandford Fleming College / Fish and Wildlife Technologist, Lindsay, Ontario, 2004

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Kemptville, Ontario, 2011

Certificate, Stantec Consulting Ltd. / WHMIS, Guelph, Ontario, 2011

PROJECT EXPERIENCE

Aggregate Services

Proposed Melancthon Quarry, Melancthon, Ontario (Terrestrial Technician)

Conducted habitat assessment and species at risk surveys and performed reporting

Multi-Unit / Family Residential

Clair Creek Meadows, Waterloo, Ontario (Terrestrial Technician)

Matthew conducted an assessment of silt fence integrity

Hammersley, Cambridge, Ontario (Terrestrial Technician)

Conducted snake cover board and amphibian surveys

Buffalo Springs Residential Development, Ontario (Terrestrial Technician)

Matthew conducted habitat assessment and species at risk surveys, and performed project reporting

Natural Sciences & Heritage Resources

Nova 2020 Plant Expansion Project, Corunna, Ontario (Terrestrial Technician)

Conducted snake cover board and amphibian surveys

Woodland Bird Nest Surveys, Ontario Ministry of Natural Resources (MNR), 2006* (Avian Nest Biologist)

Matthew performed surveys that involved finding and monitoring woodland bird nests in southern Ontario, including species at risk, radio tracking and identifying fledgling birds, as well as associated vegetation surveys

Wildlife and Habitat Surveys, 2009* (Biologist)

While working for a private consulting firm, Matthew carried out various wildlife and habitat surveys for several energy related projects, including wind farm mortality monitoring, breeding bird surveys, amphibian, reptile and mammal surveys. He also conducted scientific literature research and data entry, as well as assisted in writing project proposals and presentation to clients

Various Development Projects, 2007, 2008, 2010* (Biologist)

While working for a private consulting firm, Matthew conducted biological field surveys and associated data management and analysis for various developments throughout Ontario and other provinces, including renewable energy. These involved breeding bird surveys, nest searches, amphibian counts, salamander population monitoring for species at risk, wind farm mortality monitoring, bat species and abundance monitoring and wetland evaluation. He also conducted associated research and assisted in reporting

** denotes projects completed with other firms*

Matthew Ross B.Sc.

Ecologist

Oil and Gas Pipelines

TransCanada Pipelines Ltd., Eastern Mainline Expansion, Ontario (Terrestrial Technician)
Conducted species at risk breeding bird surveys

Enbridge Integrity Dig Program, Ontario (Terrestrial Technician)
Conducted nesting bird surveys and nest monitoring surveys

Trans-Northern Pipelines Inc., Bronte Creek Risk Assessment, Burlington, Ontario (Terrestrial Technician)
Assisted in conducting an initial site assessment and salamander egg mass survey

Nova Chemicals Genesis Pipeline Extension, Corunna, Ontario (Terrestrial Technician)
Conducted snake cover board and amphibian surveys

St. Clair Pipelines Bluewater River Crossing Replacement, Corunna, Ontario (Terrestrial Technician)
Conducted snake cover board and amphibian surveys

Post-Construction

Victoria Park, Kitchener, Ontario (Terrestrial Technician)
Conducted post-construction migratory waterfowl, botanical inventory and replanting monitoring surveys

Renewable Energy

Solray Renewable Solar Energy Project, Ontario (Terrestrial Technician)
Conducted due diligence site assessment with client to identify project constraints and assisted in reporting

Various Renewable Wind Energy Projects, Ontario (Terrestrial Technician)
Conducted ELC, amphibian, migratory passerine, waterfowl, raptor and crepuscular bird auditory surveys, species at risk habitat assessment and surveys, amphibian surveys, post-construction monitoring, and assisted with technical reporting for various wind energy projects, including Wolfe Island Wind Farm, Ameherst Island Wind Farm, White Pines Wind Farm, Niagara Region Wind Centre, Bow Lake Wind Farm, K2 Wind Project, Cedar Point Wind Project, and Dorland Wind Project

Roads and Highways

Detail Design for the Rehabilitation of Highway 6/10 from Chatsworth to Owen Sound, Grey County, Ontario (Terrestrial Technician)
This study included a 15 km stretch of highway through several significant natural habitat features, including the Niagara Escarpment, Life Science ANSI, unevaluated wetlands, and large continuous tracts of mature forest and riparian habitat. Matt's responsibilities on this assignment included Ecological Land Classification, bird surveys and surveys for species at risk, documentation of wildlife species and habitat, and mapping of birds' nests

** denotes projects completed with other firms*

Katherine St. James MSc, BSc

Terrestrial Ecologist

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

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

EDUCATION

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

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

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

PROJECT EXPERIENCE

Environmental Assessment

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

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

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

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

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

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

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

** denotes projects completed with other firms*

Katherine St. James MSc, BSc

Terrestrial Ecologist

PUBLICATIONS

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

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

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

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

Robert Stamp
Ornithologist

Bob joined Stantec in 2004 as an avian ecologist. He been birding for more than 50 years and has compiled an extensive life list. At Stantec, Bob is responsible for carrying out seasonal bird and wildlife field surveys throughout Ontario, including pre and post construction monitoring at wind farms across the province. Bob also has extensive experience conducting bird surveys for development and aggregate projects.

EDUCATION

Bachelor of Science, Honors, McMaster University, Biology, Hamilton, Ontario.

PROFFESIONAL MEMBERSHIPS

Ontario Field Ornithologists, Member

Hamilton Naturalists Club, Member

PROJECT EXPERIENCE

Port Alma Wind Project, Municipality of Chatham-Kent, Ontario (Ornithologist)
Pre and post construction bird surveys.

Melancthon Wind Project, Dufferin County, Ontario (Ornithologist)
breeding bird surveys and post construction montotirng

Wolfe Island Wind Project, Wolfe Island, Ontario (Ornithologist)
Pre and post construction breeding, migratory and wintering birds.

Port Dover and Nanticoke Wind Project, Ontario (Ornithologist)
Pre and post construction bird surveys.

Melissa A. Straus M.Sc.

Terrestrial Ecologist

Melissa Straus completed her undergraduate degree with honours in Environmental Sciences at the University of Guelph and her Masters degree in Biology at Trent University. Her M.Sc. focused on the effects of silvicultural practices on reproductive success of cavity-nesting birds in southwestern Ontario.

Melissa is a Terrestrial Ecologist with experience in various sectors, including aggregate services, electrical power distribution, oil and gas, renewable energy, residential development and transportation planning. Her experience involves implementation of the *Migratory Birds Convention Act* and *Species at Risk Act*. Melissa is a skilled birder and has field experience conducting avian, reptile, amphibian, Ecological Land Classification (ELC), and botany surveys, as well as conducting post-construction monitoring at wind farms.

EDUCATION

M.Sc. in Biology, Trent University, Peterborough, Ontario, 2009

B.Sc. in Environmental Sciences, Co-op Program, University of Guelph, Guelph, Ontario, 2003

Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System, North Bay, Ontario, 2012

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Kemptville, Ontario, 2010

PROJECT EXPERIENCE

Aggregate Services

Proposed Melancthon Quarry, The Highland Companies, Melancthon Township, Ontario (Terrestrial Ecologist)

Conducted habitat assessment and species at risk surveys.

Proposed Acton Quarry Extension, Dufferin Aggregates, Acton, Ontario (Terrestrial Ecologist)

Conducted evening amphibian surveys in accord with MNR protocols.

Electrical Power Distribution

Hydro One Bruce X Milton Transmission Reinforcement, Bruce County, Ontario (Ecologist)

Located and protected active bird nests during land clearing to ensure client compliance with the Migratory Birds Convention Act.

Multi-Unit / Family Residential

Natural Heritage Evaluations for Various Residential Development Projects, Southern Ontario (Terrestrial Ecologist)

Terrestrial surveys included breeding bird, species at risk, habitat assessment, and ELC for various residential development projects.

Municipal

City of Hamilton Professional and Consultant Services Roster 2011-2012 (C12-06-10); Garner/Rymal Road and Garth Street Environmental Assessment, Hamilton, Ontario (Terrestrial and Avian Ecologist)

Served as study lead and conducted tree inventory to document existing trees and shrubs within 10 m of the existing municipal right-of-way; identified constraints with respect to Species at Risk within the right-of-way for the proposed expansion of Garner/Rymal Road.

Natural Sciences & Heritage Resources

Conservation Planning*, Mississauga, Ontario (Conservation Planning Assistant)

Created conservation plans for private landowners in the Credit Valley Watershed and inventoried vegetation using Ecological Land Classification for Southern Ontario protocol.

Forestry Impacts on Regeneration Rates and Bird Communities Research*, East Lansing, Michigan (Field Assistant)

Performed avian point counts in the upper peninsula of Michigan, estimated White-tailed Deer densities, and completed specialized vegetation surveys to assess forest regeneration rates.

** denotes projects completed with other firms*

Melissa A. Straus M.Sc.

Terrestrial Ecologist

Forest Bird Research*, London, Ontario (Project Biologist)
Prepared a manuscript on the nesting success of cavity-nesting birds in woodlots subjected to silviculture, conducted a meta-analysis of edge effects on nesting success of songbirds, and created fact sheets for a landowner stewardship guide. Conducted salamander mark and recapture surveys, nest searching and monitoring, completed numerous vegetation surveys, located and reported avian and vegetative species at risk, collected and identified invertebrates to Order.

Oil and Gas Pipelines

Enbridge Project Nexus Interconnect Pipeline, Mooretown, Ontario (Terrestrial Ecologist)
Species at risk surveys for various vegetation species and coverboard surveys for Butler's Gartersnake.

Renewable Energy

Melancthon Ecopower Centre, Melancthon Township, Ontario (Terrestrial Ecologist)
Participated in environmental monitoring of post-construction wind turbine impacts on bird and bat mortalities.

White Pines, Picton, Ontario (Terrestrial Ecologist)
Conducted ELC, amphibian, and crepuscular bird auditory surveys.

Grand Renewable Energy Park, Cayuga, Ontario (Terrestrial Ecologist / Technical Reporting)
Conducted ELC and wildlife habitat assessment; coordinated and conducted winter raptor and Short-eared Owl surveys; assisted with NHA, EIS, and APRD reporting for proposed wind and solar project.

Wolfe Island Wind Plant, Wolfe Island, Ontario (Terrestrial Ecologist)
Conducated winter raptor and raptor disturbance surveys as well as assisting with permitting reports and post-construction mortality monitoring trials.

Kruger Energy Port Alma, Port Alma, Ontario (Terrestrial Ecologist / Coordinator)
Coordinated on site subcontractors conducting mortality monitoring and scavenger trials, some permit reporting.

Transportation Planning

MTO Highway 40, Chatham, Ontario (Terrestrial Ecologist)
Conducted reptile and species at risk surveys and habitat assessment.

MTO Highway 24, Cambridge, Ontario (Terrestrial Ecologist)
Conducted reptile and avian species at risk surveys and habitat assessment.

** denotes projects completed with other firms*

Melissa A. Straus M.Sc.

Terrestrial Ecologist

PUBLICATIONS

Straus, M.A., K. Bavrlic, E. Nol, D.M. Burke, K.A. Elliott. Reproductive success of cavity-nesting birds in partially harvested woodlots. *Canadian Journal of Forest Research, 41: 1004-1017*, 2011.

Burke, D., K. Elliott, K. Falk, and T. Pirano. (M. Straus, contributing author). A land manager's guide to conserving habitat for forest birds in southern Ontario. *Minstry of Natural Resources and Trent University*, 2011.

Straus, M. Reproductive success of cavity-nesting birds in partially harvested woodlots in southwestern Ontario. *M.Sc. Thesis, Department of Biology, Trent University, Ontario, Canada*, 2009.

Straus, M. The effects of partial harvesting on cavity-nesting bird communities in southwestern Ontario. *Society of Canadian Ornithologists (SCO-SOC) Conference Poster*, 2007.

Peterborough Field Naturalists Guest Speaker. *Impacts of partial harvesting on cavity-nesting birds in southwestern Ontario*, 2006.

Straus, M. Carolinian forests of southern Ontario: Species at risk and cavity-nesters. *Guelph Field Naturalists Guided Hike*, 2006.

Shannon D. Catton M.Sc.

Terrestrial Ecologist / Project Manager

Shannon Catton is a senior terrestrial ecologist and project manager who has successfully managed both small and large projects, including environmental impact statements, constraint analyses, natural heritage assessments for Renewable Energy Applications, and environmental implementation reports. Shannon specializes in Species at Risk (SAR) permitting, and has been extensively engaged with the Ministry of Natural Resources with regard to permitting for complex SAR applications.

Shannon is certified in the Ministry of Natural Resources Ecological Land Classification (ELC) and Ontario Wetland Evaluation Systems (OWES), complementing her experience in conducting vegetation surveys including identification of vascular plants and plant communities, sampling of vegetation and soils, identification of reptiles, amphibians, mammals, and habitats, as well as statistical analyses.

Shannon possesses strong public relations skills, and is a capable communicator with both the public and private sectors. She has presented her research at national and international conferences, and has presented project-related results at various workshops and seminars to governing agencies and local interest groups regarding a large scale environmental assessment, as well as presentations to internal and external clients regarding the *Species at Risk Act* and the *Endangered Species Act*. Shannon also is a published author in various peer-reviewed publications.

EDUCATION

M.Sc., University of Guelph / Botany, Guelph, Ontario, 2006

B.A., B.Sc., University of Guelph / Sociology and Biology (Hons), Guelph, Ontario, 2003

Certificate, Ontario Ministry of Natural Resources Ontario Wetland Evaluation Systems (OWES) Training Course, North Bay, Ontario, 2008

Certificate, Ontario Ministry of Natural Resources Ecological Land Classification for Southern Ontario (ELC), Turkey Point, Ontario, 2006

PROJECT EXPERIENCE

Aggregate Services

Terrestrial Surveys for Various Pit and Quarry Implementation and Extension Projects, Ontario (Terrestrial Ecologist)

Terrestrial surveys for the following projects included habitat assessments, floral inventories, tree surveys, American Hart's-tongue Fern surveys (a species at risk), winter wildlife surveys, salamander egg mass surveys and reptile hibernacula surveys:
- Proposed Duntroon Quarry Extension, Duntroon, ON
- Proposed Hillsburgh Quarry, Hillsburgh, ON
- Proposed Flamborough Quarry, Hamilton, ON
- Proposed West Montrose Quarry, West Montrose, ON

Dufferin Aggregates Acton Quarry Extension, Acton, Ontario (Terrestrial Ecologist / Project Manager)

Terrestrial surveys included salamander migration surveys, salamander egg mass surveys, salamander tissue sampling (in conjunction with MNR), and amphibian calling surveys. Coordination of project includes additional fieldwork, technical reporting and species at risk permit applications, as well as ongoing collaboration with various government agencies and stakeholders

Electrical Power Distribution

Midtown Electricity Infrastructure Renewal Project, Toronto, Ontario (Terrestrial Lead / Project Manager)

Conducted terrestrial surveys, including vegetation community assessments, floral inventory, and species at risk habitat assessments

Darlington Power Plant, Pickering, Ontario (Terrestrial Lead / Project Manager)

Coordinated terrestrial surveys, including vegetation community assessments, floral inventory, and species at risk habitat assessments

** denotes projects completed with other firms*

Shannon D. Catton M.Sc.

Terrestrial Ecologist / Project Manager

Coote's Paradise Transmission Reinforcement Project, Hamilton, Ontario (Terrestrial Lead, Technical Reporting)
Terrestrial surveys included vegetation community assessments, floral inventory and species at risk habitat assessments. Technical reporting and species at risk assessment in conjunction with local Conservation Authority

Bruce to Milton Transmission Reinforcement Project Environmental Assessment Report and Vegetation Enhancement Plans, Southern Ontario (Lead Terrestrial Ecologist)
Terrestrial surveys included vegetation community assessments, floral inventories, winter wildlife and species at risk habitat assessments. Technical reporting and development of a comprehensive terrestrial monitoring and mitigation report. Designed and wrote vegetation enhancement plans for lands within Niagara Escarpment Plan area

Natural Sciences & Heritage Resources

Nature Counts Natural Areas Inventory, Hamilton Conservation Authority* (Ecological Land Classification Coordinator)
Provided the Hamilton Conservation Authority and the City of Hamilton with current vegetation inventories and identified and classified Areas of Natural and Scientific Interest (ANSI) using Ecological Land Classification (ELC). Other tasks included habitat mapping, air photo interpretation, orienteering, GPS, ground truthing, mineral and organic soil description and identification and soil moisture regimes and drainage

Oil & Gas

TransCanada PipeLines Parkway Loop, Greater Toronto Area, Ontario (Terrestrial Lead and Support)
Provided guidance and support regarding the Endangered Species Act, species at risk, and municipal permitting, as well as provided support and technical advice regarding woodlot inventories and restoration concept plans

NOVA Chemicals Pipeline Extension Project, Sarnia, Ontario (Natural Heritage Lead and Senior Reviewer)
Designed and coordinated terrestrial field program. Provided support and senior review of natural heritage reports, species at risk reports, Endangered Species Act permitting, and Letters of Advice

Bluewater River Crossing Replacement Project, Sarnia, Ontario (Natural Heritage Lead and Senior Reviewer)
Designed and coordinated terrestrial field program. Provided support and senior review of natural heritage reports, species at risk reports, Endangered Species Act permitting, and Letters of Advice

Proposed Bickford to Dawn Pipeline Project, Chatham, Ontario (Terrestrial Lead, Technical Reporting)
Terrestrial surveys included vegetation community assessments, floral inventory and species at risk habitat assessments. Study design and development in conjunction with local OMNR district for Eastern Foxsnake, including a species at risk 17b permit application

Renewable Energy

St. Columban Wind Project, St. Columban, Ontario (Natural Heritage Lead)
Wrote the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS), the Environmental Effects Monitoring Plan (EEMP), and the Species at Risk (SAR) Report

Almonte Solar Project, Almonte, Ontario (Natural Heritage Lead)
Wrote the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) and provided senior review of the Species at Risk (SAR) Report. Completed an Endangered Species Act C Permit for Bobolink and Eastern Meadowlark

Grand Renewable Energy Park, Haldimand County, Ontario (Natural Heritage and Species at Risk Support)
Wrote and reviewed the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) and the Species at Risk (SAR) Report. Completed an Endangered Species Act C Permit for Bobolink and Eastern Meadowlark

Niagara Region Wind Farm, Niagara Region, Ontario (Species at Risk Reviewer and Support)
Provided senior guidance and review of the Species at Risk (SAR) Report

Springwood Wind Project, Wellington County, Ontario (Natural Heritage Support)
Contributed to writing the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) and provided support regarding species at risk

** denotes projects completed with other firms*

Shannon D. Catton M.Sc.

Terrestrial Ecologist / Project Manager

Whittington Wind Project, Township of Amaranth, Ontario (Natural Heritage Support)
Contributed to writing the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS), and provided support regarding species at risk

David Brown Solar, Cornwall, Ontario (Natural Heritage Support)
Provided senior guidance with the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS), and provided support regarding species at risk

Melancthon I Wind Plant Project, Shelburne, Ontario (Terrestrial Ecologist)
Terrestrial surveys included winter raptor, both pre- and post-construction, and bird and bat mortality monitoring

Wolfe Island Wind Power Project, 86 Turbines, 197.6 MW, Wolfe Island, Ontario (Terrestrial Ecologist)
Terrestrial surveys included winter raptor, both pre- and post-construction

Research / Laboratories

Biophysical Comparisons of Quarry Floors and Alvars of Southern Ontario, University of Guelph* (Researcher and Technician)
Examined the ecological similarities and differences of abandoned limestone quarry floors and alvars to determine whether alvar habitat could be a potential restoration target for abandoned limestone quarry floors. Developed sampling designs, identified lichens, mosses and vascular plants and performed statistical analyses on descriptive and multi-variate data

Residential Development

Timberland Homes Subdivision, LaSalle, Ontario (Species at Risk Lead)
Designed and coordinated a species-specific field program for Eastern Foxsnake, and completed an Endangered Species Act C Permit for the Ministry of Natural Resources

Natural Heritage Evaluations for Various Residential Development Projects, Ontario
Environmental Impact Studies for various residential development projects in the Oak Ridges Moraine (ORM) planning area

Transportation Planning

Highway 401 Interchanges Preliminary Design Study, Woodstock, Ingersoll, and London, Ontario (Terrestrial Lead)

Highway 11, Preliminary Design Study, Access Review from Powassan to Callander, Ontario (Technical Reporting)

Highway 3 Rehabilitation, Detail Design, Renton to Jarvis, Ontario (Technical Reporting)

Highway 21 Rehabilitation, Bayfield to St. Joseph, Ontario (Terrestrial Ecologist, Technical Reporting)
Terrestrial surveys included vegetation community assessments, floral inventory, incidental wildlife and nest searches and structure assessments in compliance with the Migratory Bird Act

** denotes projects completed with other firms*

Shannon D. Catton M.Sc.

Terrestrial Ecologist / Project Manager

PUBLICATIONS

Catton, S. The Ontario Endangered Species Act: Project Implications and Proactive Management. *Presentation to various clients and Stantec personnel in various offices in Ontario*, 2012.

Matthes, U., P.J. Richardson, S. Catton, C.D. Stabler, D.W. Larson. The quarry-to-alvar initiative: Creating new alvar habitat from abandoned limestone quarries. *Canadian Reclamation, 2:10-15*, 2009.

Tomlinson, S., U. Matthes, P.J. Richardson, D.W. Larson. The ecological equivalence of quarry floors to alvars. *Applied Vegetation Science, 11:73-82*, 2008.

A comparison of the biophysical characteristics and seed banks of abandoned limestone quarry floors in southern Ontario and alvars. *M.Sc. Thesis, Department of Biology, University of Guelph, Ontario*, 2006.

A comparative analysis of the seed bank, vegetation and environmental conditions of abandoned limestone quarry floors of southern Ontario and alvars on the Bruce Peninsula, Canada. *Presentation to the World Conference on Ecological Restoration by the Society of Ecological Restoration (SER), Spain*, 2005.

Biological and physical comparisons of quarry floors and alvars. *Presentation to the Aggregate Producers' Association of Ontario Pit and Quarry Restoration Workshop, Hamilton, Ontario*, 2005.

Using alvars as a reference ecosystem to restore abandoned limestone quarries. *Poster Presentation at the A.D. Latornell Conservation Symposium, Alliston, Ontario*, 2004.

A comparative analysis of the seed bank, vegetation and environmental characteristics of abandoned limestone quarry floors of southern Ontario and alvars on the Bruce Peninsula. *Presentation to the Ontario Ecology and Ethology Colloquium (OEEC), Mississauga, Ontario*, 2004.

The quarry-to-alvar initiative: progress report. *The Ontario Aggregate Resources Corporation (TOARC) Annual Report, Burlington, Ontario*, 2004.

The quarry-to-alvar initiative: progress report. *The Ontario Aggregate Resources Corporation (TOARC) Annual Report, Burlington, Ontario*, 2003.

The quarry-to-alvar initiative: restoring value to abandoned quarries. *The Ontario Aggregate Resources Corporation (TOARC) Annual Report, Burlington, Ontario*, 2002.

Appendix F

Field Notes

(CD)

Appendix G

Plant List

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
PTERIDOPHYTES		**FERNS & ALLIES**								
Aspleniaceae		**Spleenwort Family**								
Asplenium	*rhizophyllum*	Walking Fern	9	5		S4			G5	X
Asplenium	*trichomanes* ssp. *trichomanes*	Maidenhair Spleenwort		5		SU			G5T5	
Dennstaedtiaceae		**Bracken Fern Family**								
Pteridium	*aquilinum* var. *latiusculum*	Eastern Bracken-fern	2	3		S5			G5T	X
Dryopteridaceae		**Wood Fern Family**								
Athyrium	*filix-femina* var. *angustum*	Northern Lady Fern	4	0		S5			G5T5	X
Cystopteris	*bulbifera*	Bulblet Bladder Fern	5	-2		S5			G5	X
Dryopteris	*carthusiana*	Spinulose Wood Fern	5	-2		S5			G5	X
Dryopteris	*goldiana*	Goldie's Fern	10	0		S4			G4	R
Matteuccia	*struthiopteris* var. *pensylvanica*	Ostrich Fern	5	-3		S5			G5	X
Onoclea	*sensibilis*	Sensitive Fern	4	-3		S5			G5	
Polystichum	*acrostichoides*	Christmas Fern	5	5		S5			G5	X
Equisetaceae		**Horsetail Family**								
Equisetum										
Equisetum	*arvense*	Field Horsetail	0	0		S5			G5	X
Lycopodiaceae		**Clubmoss Family**								
Diphasiastrum	*digitatum*	Southern Running-pine	5	5		S5			G5	X
Lycopodium	*species*									
Ophioglossaceae		**Adder's Tongue Family**								
Botrychium	*virginianum*	Rattlesnake Fern	5	3		S5			G5	X
Osmundaceae		**Royal Fern Family**								
Osmunda	*cinnamomea*	Cinnamon Fern	7	-3		S5			G5	X
Osmunda	*regalis* var. *spectabilis*	Royal Fern	7	-5		S5			G5T	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Polypodiaceae		**Polypody Family**								
Polypodium	*virginianum*	Rock Polypody Fern	6	5		S5			G5	X
Pteridaceae		**Maidenhair Fern Family**								
Adiantum	*pedatum*	Northern Maidenhair Fern	7	1		S5			G5	X
Thelypteridaceae		**Marsh Fern Family**								
Thelypteris	*palustris* var. *pubescens*	Marsh Fern	5	-4		S5			G5T?	X
GYMNOSPERMS		**CONIFERS**								
Thuja	*occidentalis*	Eastern White Cedar	4	-3		S5			G5	X
Pinaceae		**Pine Family**								
Abies	*balsamea*	Balsam Fir	5	-3		S5			G5	R
Larix	*laricina*	Tamarack	7	-3		S5			G5	R
Picea	*glauca*	White Spruce	6	3		S5			G5	X
Picea	*mariana*	Black Spruce	8	-3		S5			G5	R
Pinus	*resinosa*	Red Pine	8	3		S5			G5	X
Pinus	*strobus*	Eastern White Pine	4	3		S5			G5	X
Pinus	*sylvestris*	Scotch Pine		5	-3	SE5			G?	I
Tsuga	*canadensis*	Eastern Hemlock	7	3		S5			G5	X
DICOTYLEDONS		**DICOTS**								
Amaranthaceae		**Amaranth Family**								
Amaranthus	*retroflexus*	Green Amaranth		2	-1	SE5			G?	I
Atriplex	*species*									
Chenopodium	*species*									
Chenopodium	*album* var. *album*	Lamb's Quarters		1	-1	SE5			G5T5	I
Anacardiaceae		**Sumac or Cashew Family**								
Rhus	*typhina*	Staghorn Sumac	1	5		S5			G5	X
Toxicodendron	*radicans var. radicans*	Eastern Poison-ivy	5	-1		S5			G5T	X
Toxicodendron	*radicans var. rydbergii*	Western Poison-ivy	0	0		S5			G5T	X
Apiaceae		**Carrot or Parsley Family**								

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Aegopodium	*podagraria*	Goutweed		0	-3	SE5			G?	I
Cicuta	*bulbifera*	Bulb-bearing Water-hemlock	5	-5		S5			G5	X
Cicuta	*maculata*	Spotted Water-hemlock	6	-5		S5			G5	X
Daucus	*carota*	Wild Carrot		5	-2	SE5			G?	I
Osmorhiza	*species*									
Osmorhiza	*claytonii*	Woolly Sweet-cicely	5	4		S5			G5	X
Osmorhiza	*longistylis*	Anise-root	6	4		S5			G5	X
Sanicula	*marilandica*	Black Snakeroot	5	3		S5			G5	X
Sium	*suave*	Hemlock Water-parsnip	4	-5		S5			G5	X
Zizia	*aurea*	Golden Alexanders	7	-1		S5			G5	R
Apocynaceae		**Dogbane Family**								
Apocynum	*androsaemifolium* ssp. *androsaemifolium*	Spreading Dogbane	3	5		S5			G5T?	X
Apocynum	*cannabinum* var. *cannabinum*	Indian Hemp		1		S5			G5T	X
Asclepias	*incarnata* ssp. *incarnata*	Swamp Milkweed	6	-5		S5			G5T5	X
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5	X
Vinca	*minor*	Periwinkle		5	-2	SE5			G?	I
Aquifoliaceae		**Holly Family**								
Ilex	*verticillata*	Winterberry	5	-4		S5			G5	C
Araliaceae		**Ginseng Family**								
Aralia	*nudicaulis*	Wild Sarsaparilla	4	3		S5			G5	X
Aristolochiaceae		**Duchman's-pipe Family**								
Asarum	*canadense*	Wild Ginger	6	5		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Asteraceae		**Composite or Aster Family**								
Achillea	*millefolium* ssp. *millefolium*	Common Yarrow		3	-1	SE?			G5T?	I
Ambrosia	*artemisiifolia*	Common Ragweed	0	3		S5			G5	X
Ambrosia	*trifida*	Giant Ragweed	0	-1		S5			G5	X
Arctium	*minus*	Common Burdock		5	-2	SE5			G?T?	I
Bidens	*species*									
Bidens	*cernua*	Nodding Beggar-ticks	2	-5		S5			G5	X
Bidens	*frondosa*	Devil's Beggar-ticks	3	-3		S5			G5	X
Bidens	*tripartita*	European Beggar-ticks	4	-3		S5			G5	X
Centaurea	*species*									
Cichorium	*intybus*	Chicory		5	-1	SE5			G?	I
Cirsium	*arvense*	Canada Thistle		3	-1	SE5			G?	I
Cirsium	*vulgare*	Bull Thistle		4	-1	SE5			G5	I
Conyza	*canadensis*	Horseweed	0	1		S5			G5	X
Erechtites	*hieracifolia*	Fire-weed	2	3		S5			G5	X
Erigeron	*philadelphicus var . philadelphicus*	Philadelphia Fleabane	1	-3		S5			G5T?	X
Erigeron	*strigosus*	Daisy Fleabane	0	1		S5			G5	X
Eupatorium	*perfoliatum*	Perfoliate Thoroughwort	2	-4		S5			G5	X
Eupatorium	*maculatum var . maculatum*	Spotted Joe-pye-weed	3	-5		S5			G5T5	X
Eurybia	*macrophylla*	Large-leaved Aster	5	5		S5			G5	X
Euthamia	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5	X
Hieracium	*caespitosum*	Field Hawkweed		5	-2	SE5				I
Leucanthemum	*vulgare*	Ox-eye Daisy		5	-1	SE5			G?	I
Matricaria	*discoidea*	Pineapple-weed				SE5			G5	I
Prenanthes	*species*									
Solidago	*species*									
Solidago	*altissima ssp. altissima*	Tall Goldenrod	1	3		S5				X
Solidago	*caesia var. caesia*	Blue-stem Goldenrod	5	3		S5			G5	X
Solidago	*canadensis var. canadensis*	Canada Goldenrod	1	3		S5			G5	X
Solidago	*flexicaulis*	Zig-zag Goldenrod	6	3		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Solidago	*nemoralis var . nemoralis*	Gray Goldenrod	2	5		S5			G5T?	X
Solidago	*rugosa* ssp. *rugosa*	Rough Goldenrod	4	-1		S5			G5T?	X
Symphyotrichum	*species*									
Symphyotrichum	*cordifolium*	Heart-leaved Aster	5	5		S5			G5	X
Symphyotrichum	*ericoides var. ericoides*	White Heath Aster				S5			G5T5	X
Symphyotrichum	*lanceolatum ssp. lanceolatum*	White Panicled Aster	3	-3		S5			G5T5	
Symphyotrichum	*lateriflorum var. lateriflorum*	Calico Aster	3	-2		S5			G5T5	X
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5			G5	X
Symphyotrichum	*puniceum* var. *puniceum*	Purple-stemmed Aster	6	-5		S5			G5	X
Taraxacum	*officinale*	Common Dandelion		3	-2	SE5			G5	I
Tragopogon	*dubius*	Doubtful Goat's-beard		5	-1	SE5			G?	I
Tripleurospermum	*maritima ssp. maritima*	False chamomile				SNA			G5TNR	
Tripleurospermum	*perforata*	Scentless Chamomile		5	-1	SE?			G?	
Tussilago	*farfara*	Coltsfoot		3	-2	SE5			G?	I
Xanthium	*strumarium*	Tumor-curing Cocklebur	2	0		S5			G?	X
Balsaminaceae		**Touch-me-not Family**								
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5	X
Berberidaceae		**Barberry Family**								
Berberis	*thunbergii*	Japanese Barberry		4	-3	SE5			G?	I
Caulophyllum	*thalictroides*	Blue Cohosh	6	5		S5			G	X
Podophyllum	*peltatum*	May-apple	5	3		S5			G5	X
Betulaceae		**Birch Family**								
Alnus	*species*									
Alnus	*glutinosa*	European Black Alder		-2	-2	SE4			G?	I
Alnus	*incana* spp. *rugosa*	Speckled Alder	6	-5		S5			G5T5	X
Betula	*alleghaniensis*	Yellow Birch	6	0		S5			G5	X
Betula	*papyrifera*	White Birch		2		S5			G5	X
Carpinus	*caroliniana* ssp. *virginiana*	Blue Beech	6	0		S5			G5T	X
Corylus	*americana*	American Hazel	5	4		S5			G5	R
Ostrya	*virginiana*	Hop Hornbeam	4	4		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Brassicaceae		**Mustard Family**								
Alliaria	*petiolata*	Garlic Mustard		0	-3	SE5			G5	I
Barbarea	*vulgaris*	Yellow Rocket		0	-1	SE5			G?	I
Erysimum	*cheiranthoides* ssp. *cheiranthoides*	Wormseed Mustard		3	-1	SE5				I
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5	I
Nasturtium	*officinale*	Water-cress		-5	-1	SE?			G?	I
Thlaspi	*arvense*	Field Penny-cress		5	-1	SE5			G?	I
Campanulaceae		**Bellflower Family**								
Lobelia	*siphilitica*	Great Lobelia	6	-4		S5			G5	X
Caprifoliaceae		**Honeysuckle Family**								
Diervilla	*lonicera*	Bush Honeysuckle	5	5		S5			G5	X
Lonicera	*species*									
Lonicera	*canadensis*	American Fly Honeysuckle	6	3		S5			G5	X
Lonicera	*dioica*	Glaucous Honeysuckle	5	3		S5			G5	X
Lonicera	*hirsuta*	Hairy Honeysuckle	7	0		S5			G4G5	R
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?	I
Sambucus	*canadensis*	Common Elderberry	5	-2		S5			G5	X
Sambucus	*racemosa* ssp. *pubens*	Red-berried Elderberry	5	2		S5			G5T4T5	X
Triosteum	*aurantiacum*	Wild Coffee	7	5		S5			G5	X
Viburnum	*acerifolium*	Maple-leaved Viburnum	6	5		S5			G5	X
Viburnum	*lentago*	Nannyberry	4	-1		S5			G5	X
Viburnum	*opulus*	Guelder Rose		0	-1	SE4			G5	I
Viburnum	*rafinesquianum*	Downy Arrow-wood	7	5		S5			G5	X
Viburnum	*recognitum*	Southern Arrow-wood	7	-2		S4			G5	X
Caryophyllaceae		**Pink Family**								
Cerastium	*fontanum*	Larger Mouse-ear Chickweed		3	-1	SE5			G?	I
Saponaria	*officinalis*	Bouncing-bet		3	-3	SE5			G?	I
Stellaria	*graminea*	Grass-leaved Stitchwort		5	-2	SE5			G?	I
Stellaria	*longifolia*	Long-leaved Chickweed	2	-4		S5			G5	X
Celastraceae		**Staff-tree Family**								

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Celastrus	*scandens*	Climbing Bittersweet	3	3		S5			G5	X
Euonymus	*obovata*	Running Strawberry-bush	6	5		S5			G5	X
Cornaceae		**Dogwood Family**								
Cornus	*alternifolia*	Alternate-leaved Dogwood	6	5		S5			G5	X
Cornus	*amomum* ssp. *obliqua*	Silky Dogwood	5	-4		S5			G5T?	X
Cornus	*canadensis*	Bunchberry	7	0		S5			G5	RH
Cornus	*florida*	Eastern Flowering Dogwood	7	4		S2?	END	END	G5	X
Cornus	*foemina* ssp. *racemosa*	Red Panicled Dogwood	2	-2		S5			G5?	X
Cornus	*rugosa*	Round-leaved Dogwood	6	5		S5			G5	X
Cornus	*stolonifera*	Red-osier Dogwood	2	-3		S5			G5	X
Cucurbitaceae		**Gourd Family**								
Echinocystis	*lobata*	Prickly Cucumber	3	-2		S5			G5	X
Dipsacaceae		**Teasel Family**								
Dipsacus	*fullonum* ssp. *sylvestris*	Wild Teasel		5	-1	SE5			G?T?	I
Elaeagnaceae		**Oleaster Family**								
Elaeagnus	*angustifolia*	Russian Olive		4	-1	SE3			G?	I
Elaeagnus	*umbellata*	Russian Olive		3	-3	SE3			G?	
Ericaceae		**Heath Family**								
Gaultheria	*procumbens*	Wintergreen	6	3		S5			G5	X
Vaccinium	*species*									
Vaccinium	*angustifolium*	Low Sweet Blueberry	6	3		S5			G5	X
Vaccinium	*corymbosum*	Highbush Blueberry	8	-3		S4			G5	X
Vaccinium	*myrtilloides*	Velvet-leaf Blueberry	7	-2		S5			G5	R
Fabaceae		**Pea Family**								
Amphicarpaea	*bracteata*	Hog Peanut	4	0		S5			G5	X
Gleditsia	*triacanthos*	Honey Locust	3	0		S2			G5	X
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5			G?	I
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?	I
Medicago	*sativa* ssp. *sativa*	Alfalfa		5	-1	SE5			G?T?	I
Melilotus	*species*									
Melilotus	*alba*	White Sweet-clover		3	-3	SE5			G?	I

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Robinia	*pseudo-acacia*	Black Locust		4	-3	SE5			G5	I
Trifolium	*species*									
Trifolium	*pratense*	Red Clover		2	-2	SE5			G?	I
Trifolium	*repens*	White Clover		2	-1	SE5			G?	I
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?	I
Vicia	*tetrasperma*	Slender Vetch		5	-1	SE5			G?	I
Fagaceae		**Beech Family**								
Fagus	*grandifolia*	American Beech	6	3		S5			G5	X
Fagus	*sylvatica*	European Beech								
Quercus	*alba*	White Oak	6	3		S5			G5	X
Quercus	*bicolor*	Swamp White Oak	8	-4		S4			G5	X
Quercus	*macrocarpa*	Bur Oak	5	1		S5			G5	X
Quercus	*palustris*	Pin Oak	9	-3		S4			G5	X
Quercus	*rubra*	Red Oak	6	3		S5			G5	X
Quercus	*velutina*	Black Oak	8	5		S4			G5	X
Geraniaceae		**Geranium Family**								
Geranium	*maculatum*	Spotted Crane's-bill	6	3		S5			G5	X
Geranium	*robertianum*	Herb-robert		5	-2	SE5			G5	I
Grossulariaceae		**Currant Family**								
Ribes	*species*									
Ribes	*americanum*	Wild Black Currant	4	-3		S5			G5	X
Ribes	*cynosbati*	Prickly Gooseberry	4	5		S5			G5	X
Ribes	*hirtellum*	Smooth Gooseberry	6	-3		S5			G5	R
Guttiferae		**St. John's-wort Family**								
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SE5			G?	I
Hamamelidaceae		**Witch-hazel Family**								
Hamamelis	*virginiana*	Witch-hazel	6	3		S5			G5	X
Hydrophyllaceae		**Water-leaf Family**								
Hydrophyllum	*canadense*	Broad-leaved Water-leaf	8	-2		S4			G5	X
Hydrophyllum	*virginianum*	Virginia Water-leaf	6	-2		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Juglandaceae		**Walnut Family**								
Carya	*cordiformis*	Bitternut hickory	6	0		S5			G5	X
Carya	*ovata* var. *ovata*	Shagbark Hickory	6	3		S5			G5	X
Juglans	*cinerea*	Butternut	6	2		S3?	END	END	G4	X
Juglans	*nigra*	Black Walnut	5	3		S4			G5	X
Lamiaceae		**Mint Family**								
Ajuga	*reptans*	Creeping Bugleweed		5	-1	SE2			G?	
Glechoma	*hederacea*	Creeping Charlie		5	-2	SE5			G?	I
Leonurus	*cardiaca* ssp. *cardiaca*	Common Motherwort		5	-2	SE5			G?T?	I
Lycopus	*americanus*	Cut-leaved Water-horehound	4	-5		S5			G5	X
Lycopus	*uniflorus*	Northern Water-horehound	5	-5		S5			G5	X
Mentha	*species*									
Mentha	*arvensis* ssp. *borealis*	American Wild Mint	3	-3		S5				X
Monarda	*fistulosa*	Wild Bergamot	6	3		S5			G5	X
Prunella	*vulgaris* ssp. *vulgaris*	Common Heal-all		0	-1	SE3			G5T?	I
Lauraceae		**Laurel Family**								
Lindera	*benzoin*	Spicebush	6	-2		S5			G5	X
Lythraceae		**Loosestrife Family**								
Lythrum	*salicaria*	Purple Loosestrife		-5	-3	SE5			G5	X
Malvaceae		**Mallow Family**								
Abutilon	*theophrasti*	Velvet-leaf		4	-1	SE5			G?	I
Malva	*species*									
Moraceae		**Mulberry Family**								
Morus	*alba*	White Mulberry		0	-3	SE5			G?	I
Nymphaeaceae		**Water-lily Family**								
Nuphar	*variegata*	Bulhead Pond-lily	4	-5		S5			G5	U
Oleaceae		**Olive Family**								
Fraxinus	*americana*	White Ash	4	3		S5			G5	X
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Fraxinus	*pennsylvanica*	Red Ash	3	-3		S5			G5	X
Ligustrum	*vulgare*	Common Privet		1	-2	SE5			G?	I
Syringa	*vulgaris*	Common Lilac		5	-2	SE5			G?	I
Onagraceae		**Evening-primrose Family**								
Circaea	*lutetiana* ssp. *canadensis*	Yellowish Enchanter's Nightshade	3	3		S5			G5T5	X
Epilobium	*species*	Willow-herb speices								
Ludwigia	*palustris*	Marsh Purslane	5	-5		S5			G5	X
Oenothera	*biennis*	Common Evening-primrose	0	3		S5			G5	X
Orobanchaceae		**Broom-rape Family**								
Epifagus	*virginiana*	Beech-drops	6	5		S5			G5	X
Oxalidaceae		**Wood Sorrel Family**								
Oxalis	*species*									
Oxalis	*stricta*	Upright Yellow Wood-sorrel	0	3		S5			G5	
Papaveraceae		**Poppy Family**								
Chelidonium	*majus*	Celandine		5	-3	SE5			G?	I
Sanguinaria	*canadensis*	Bloodroot	5	4		S5			G5	X
Phytolaccaceae		**Pokeweed Family**								
Phytolacca	*americana*	Pokeweed	3	1		S4			G5	X
Plantaginaceae		**Plantain Family**								
Plantago	*major*	Common Plantain		-1	-1	SE5			G5	I
Plantago	*rugelii*	Rugel's Plantain	1	0		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Polygonaceae		**Smartweed Family**								
Fallopia	*japonica var. japonica*	Japanese Knotweed		3	-1	SE4			G?	I
Persicaria	*species*									
Persicaria	*amphibia*	Water Smartweed	5	-5		S5			G5	U
Persicaria	*lapathifolia*	Pale Smartweed	2	-4		S5			G5	X
Persicaria	*maculosa*	Lady's-thumb		-3	-1	SE5			G?	I
Persicaria	*pensylvanica*	Pennsylvania Smartweed	3	-4		S5			G5	X
Persicaria	*sagittata*	Arrow-leaved Tearthumb	5	-5		S4			G5	C
Rumex	*species*									
Rumex	*acetosella*	Sheep Sorrel		0	-2	SEU			G5T	I
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SE5			G?	I
Primulaceae		**Primrose Family**								
Lysimachia	*ciliata*	Fringed Loosestrife	4	-3		S5			G5	X
Lysimachia	*nummularia*	Moneywort		-4	-3	SE5			G?	I
Lysimachia	*thyrsiflora*	Tufted Loosestrife	7	-5		S5			G5	U
Pyrolaceae		**Wintergreen Family**								
Pyrola	*species*									
Ranunculaceae		**Buttercup Family**								
Actaea	*pachypoda*	White Baneberry	6	5		S5			G5	X
Actaea	*rubra*	Red Baneberry	5	5		S5			G5	X
Anemone	*canadensis*	Canada Anemone	3	-3		S5			G5	X
Anemone	*acutiloba*	Sharp-lobed Hepatica	6	5		S5			G5	X
Anemone	*americana*	Round-lobed Hepatica	6	5		S5			G?	X
Aquilegia	*canadensis*	Wild Columbine	5	1		S5			G5	X
Caltha	*palustris*	Marsh-marigold	5	-5		S5			G5	X
Coptis	*trifolia*	Goldthread	7	-3		S5			G5T5	X
Ranunculus	*species*									
Ranunculus	*abortivus*	Kidney-leaf Buttercup	2	-2		S5			G5	X
Ranunculus	*sceleratus* var. *sceleratus*	Cursed Buttercup	2	-5		S5			G5T5	X
Thalictrum	*dioicum*	Early Meadow-rue	5	2		S5			G5	X
Thalictrum	*pubescens*	Tall Meadow-rue	5	-2		S5			G5	X
Rhamnaceae		**Buckthorn Family**								

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Rhamnus	*alnifolia*	Alder-leaved Buckthorn	7	-5		S5			G5	R
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SE5			G?	I
Rhamnus	*frangula*	Glossy Buckthorn		-1	-3	SE5			G?	I
Rosaceae		**Rose Family**								
Agrimonia	*gryposepala*	Tall Hairy Agrimony	2	2		S5			G5	X
Amelanchier	*species*									
Amelanchier	*arborea*	Downy Juneberry		3		S5			G5	X
Crataegus	*species*	Hawthorn species								
Crataegus	*calpodendron*	Urn-fruited Hawthorn	4	5		S4S5			G5	X
Crataegus	*coccinea var. fulleriana*	Fuller's Hawthorn	4	5		S2?			G5T3T5Q	X
Crataegus	*monogyna*	English Hawthorn		5	-1	SE5			G5	I
Crataegus	*succulenta*	Long-spined Thorn	4	5		S4S5			G5	X
Fragaria	*vesca* ssp. *americana*	Woodland Strawberry	4	4		S5			G5T?	X
Fragaria	*virginiana* ssp. *virginiana*	Scarlet Strawberry	2	1		SU			G5T?	X
Geum	*species*									
Geum	*aleppicum*	Yellow Avens	2	-1		S5			G5	X
Geum	*canadense*	White Avens	3	0		S5			G5	X
Geum	*urbanum*	Wood Avens		5	-1	SE2			G5	
Geum	*virginianum*	Rough Avens	10	4		SH			G5	
Malus	*species*	Apple species								
Malus	*pumila*	Common Crabapple		5	-1	SE5			G5	I
Physocarpus	*opulifolius*	Ninebark	5	-2		S5			G5	U
Potentilla	*species*									
Potentilla	*reptans*	Creeping Cinquefoil				SE2			G?	
Potentilla	*simplex*	Old-field Cinquefoil	3	4		S5			G5	X
Prunus	*avium*	Sweet Cherry		5	-2	SE4			G?	I
Prunus	*nigra*	Canada Plum	4	4		S4			G4G5	R
Prunus	*pensylvanica*	Pin Cherry	3	4		S5			G5	R
Prunus	*serotina*	Black Cherry	3	3		S5			G5	X
Prunus	*virginiana* ssp. *virginiana*	Choke Cherry	2	1		S5			G5T?	X
Pyrus	*communis*	Common Pear		5	-1	SE4			G5	I
Rosa	*blanda*	Smooth Rose	3	3		S5			G5	X
Rosa	*palustris*	Marsh Rose	7	-5		S5			G5	X
Rubus	*allegheniensis*	Alleghany Blackberry	2	2		S5			G5	X
Rubus	*canadensis*	Millspaugh's Blackberry	7	5		S4?			G5	
Rubus	*hispidus*	Trailing Blackberry	6	-3		S4S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Rubus	*idaeus* ssp. *strigosus*	Wild Red Raspberry	0	-2		S5			G5T5	X
Rubus	*occidentalis*	Thimble-berry	2	5		S5			G5	X
Rubus	*odoratus*	Purple Flowering Raspberry	3	5		S5			G5	X
Rubus	*pubescens*	Dwarf Raspberry	4	-4		S5			G5	X
Rubus	*setosus*	Bristly Raspberry	8	-2		S4?			G5	
Spiraea	*alba*	Narrow-leaved Meadow-sweet	3	-4		S5			G5	X
Waldsteinia	*fragarioides*	Barren Strawberry	5	5		S5			G5	X
Rubiaceae		**Madder Family**								
Cephalanthus	*occidentalis*	Eastern Buttonbush	7	-5		S5			G5	X
Galium	*species*									
Galium	*aparine*	Cleavers	4	3		S5			G5	X
Galium	*asprellum*	Rough Bedstraw	6	-5		S5			G5	X
Galium	*circaezans*	White Wild Licorice	7	4		S5			G5	X
Galium	*mollugo*	White Bedstraw		5	-2	SE5			G?	I
Galium	*palustre*	Marsh Bedstraw	5	-5		S5			G5	C
Mitchella	*repens*	Creeping Partridge-berry	6	2		S5			G5	X
Rutaceae		**Rue Family**								
Ptelea	*trifoliata*	Common Hop-tree	9	2		S3	THR	THR	G5	X
Zanthoxylum	*americanum*	American Prickly-ash	3	5		S5			G5	X
Salicaceae		**Willow Family**								
Populus	*balsamifera* ssp. *balsamifera*	Balsam Poplar	4	-3		S5			G5T?	X
Populus	*deltoides* ssp. *deltoides*	Eastern Cottonwood	4	-1		SU			G5T5	X
Populus	*grandidentata*	Large-tooth Aspen	5	3		S5			G5	X
Populus	*tremuloides*	Trembling Aspen		0		S5			G5	X
Salix	*species*	Willow species								
Salix	*alba*	White Willow			-2	SE4			G5	X
Salix	*amygdaloides*	Peach-leaved Willow	6	-3		S5			G5	X
Salix	*eriocephala*	Missouri Willow	4	-3		S5			G5	X
Salix	*interior*	Sandbar Willow	3	-5		S5			G5	X
Salix	*nigra*	Black Willow	6	-5		S4?			G5	X
Salix X	*fragilis*	Hybrid Crack WIllow		-1	-3	SE5			G?	
Salix X	*sepulcralis*	Hybrid Willow				SE2			HYB	

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Sapindaceae		**Maple Family**								
Acer	*negundo*	Manitoba Maple	0	-2		S5			G5	X
Acer	*nigrum*	Black Maple	7	3		S4?			G5Q	X
Acer	*platanoides*	Norway Maple		5	-3	SE5			G?	I
Acer	*rubrum*	Red Maple	4	0		S5			G5	X
Acer	*saccharinum*	Silver Maple	5	-3		S5			G5	X
Acer	*saccharum*	Sugar Maple	4	3		S5			G5T?	X
Acer X	*freemanii*	Freeman's Maple								X
Aesculus	*hippocastanum*	Horse Chestnut		5	-1	SNA			GNR	I
Saxifragaceae		**Saxifrage Family**								
Tiarella	*cordifolia*	False Mitrewort	6	1		S5			G5	X
Scrophulariaceae		**Figwort Family**								
Chelone	*glabra*	Turtlehead	7	-5		S5			G5	X
Verbascum	*thapsus*	Common Mullein		5	-2	SE5			G?	I
Veronica	*officinalis*	Common Speedwell		5	-2	SE5			G5	I
Solanaceae		**Nightshade Family**								
Physalis	*alkekengi*	Chinese Lantern		5	-1	SE2			G?	I
Solanum	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?	I
Tiliaceae		**Linden Family**								
Tilia	*americana*	American Basswood	4	3		S5			G5	X
Ulmaceae		**Elm Family**								
Ulmus	*americana*	White Elm	3	-2		S5			G5?	X
Ulmus	*rubra*	Slippery Elm	6	0		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Urticaceae		**Nettle Family**								
Boehmeria	*cylindrica*	False Nettle	4	-5		S5			G5	X
Laportea	*canadensis*	Wood Nettle	6	-3		S5			G5	X
Pilea	*pumila*	Dwarf Clearweed	5	-3		S5			G5	X
Urtica	*dioica* ssp. *dioica*	European Stinging Nettle		-1	-1	SE2			G5T?	I
Urtica	*dioica* ssp. *gracilis*	American Stinging Nettle	2	-1		S5			G5T?	X
Verbenaceae		**Vervain Family**								
Verbena	*hastata*	Blue Vervain	4	-4		S5			G5	X
Violaceae		**Violet Family**								
Viola	*species*									
Vitaceae		**Grape Family**								
Parthenocissus	*inserta*	Inserted Virginia-creeper	3	3		S5			G5	X
Parthenocissus	*quinquefolia*	Five-leaved Virginia-creeper	6	1		S4?			G5	X
Vitis	*riparia*	Riverbank Grape	0	-2		S5			G5	X
MONOCOTYLEDONS		**MONOCOTS**								
Alismataceae		**Water-plantain Family**								
Alisma	*plantago-aquatica*	Common Water-plantain	3	-5		S5			G5	X
Araceae		**Arum Family**								
Arisaema	*triphyllum* ssp. *triphyllum*	Small Jack-in-the-pulpit	5	-2		S5			G5T5	X
Cyperaceae		**Sedge Family**								
Carex	*species*	Sedge species								
Carex	*albursina*	White Bear Sedge	7	5		S5			G5	X
Carex	*arctata*	Drooping Wood Sedge	5	5		S5			G5?	X
Carex	*blanda*	Woodland Sedge	3	0		S5			G5?	X
Carex	*canescens* ssp. *disjuncta*	Silvery Sedge								
Carex	*crinita var. crinita*	Fringed Sedge	6	-4		S5			G5	X
Carex	*gracillima*	Graceful Sedge	4	3		S5			G5	X
Carex	*granularis*	Meadow Sedge	3	-4		S5			G5	X
Carex	*hystericina*	Porcupine Sedge	5	-5		S5			G5	X
Carex	*intumescens*	Bladder Sedge	6	-4		S5			G5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Carex	*lacustris*	Lake-bank Sedge	5	-5		S5			G5	C
Carex	*lupulina*	Hop Sedge	6	-5		S5			G5	X
Carex	*pensylvanica*	Pennsylvania Sedge	5	5		S5			G5	X
Carex	*plantaginea*	Plantain-leaved Sedge	7	5		S5			G5	X
Carex	*radiata*	Radiate Sedge	4	5		S4			G4	
Carex	*rosea*	Stellate Sedge	5	5		S5			G5	X
Carex	*scoparia var. scoparia*	Pointed Broom Sedge	5	-3		S5			G5	X
Carex	*stipata var. stipata*	Awl-fruited Sedge	3	-5		S5			G5	X
Carex	*tenuiflora*	Sparse-flowered Sedge	10	-5		S5			G5	
Carex	*utriculata*	Beaked Sedge	7	-5		S5			G5	R
Carex	*vulpinoidea*	Fox Sedge	3	-5		S5			G5	X
Cyperus	*esculentus var. leptostachyus*	Yellow Nut-grass	1	-3		S5			G5	U
Eleocharis	*species*									
Schoenoplectus	*species*									
Schoenoplectus	*tabernaemontani*	Soft-stemmed Bulrush	5	-5		S5			G5	X
Scirpus	*atrovirens*	Dark-green Bulrush	3	-5		S5			G5?	X
Scirpus	*cyperinus*	Wool-grass	4	-5		S5			G5	X
Scirpus	*microcarpus*	Small-fruited Bulrush	4	-5		S5			G5	R
Iridaceae		**Iris Family**								
Iris	*pseudacorus*	Yellow Iris		-5	-2	SE3			G?	I
Iris	*versicolor*	Multi-coloured Blue-flag	5	-5		S5			G5	X
Juncaceae		**Rush Family**								
Juncus	*effusus* ssp. *solutus*	Soft Rush	4	-5		S5			G5T?	X
Lemnaceae		**Duckweed Family**								
Lemna	*minor*	Lesser Duckweed	2	-5		S5			G5	X
Wolffia	*columbiana*	Water-meal	4	-5		S4S5			G5	R

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Liliaceae		**Lily Family**								
Allium	*canadense* var. *canadense*	Canada Wild Onion	8	3		S5			G5T	X
Allium	*tricoccum*	Wild Leek	7	2		S5			G5	X
Asparagus	*officinalis*	Garden Asparagus		3	-1	SE5			G5?	I
Clintonia	*borealis*	Bluebead-lily	7	-1		S5			G5	RH
Convallaria	*majalis*	Lily-of-the-valley		5	-2	SE5			G5	I
Lilium	*lancifolium*	Tiger Lily		5	-1	SE1			G?	
Lilium	*michiganense*	Michigan Lily	7	-1		S5			G5	X
Maianthemum	*canadense*	Wild Lily-of-the-valley	5	0		S5			G5	X
Maianthemum	*racemosum* ssp. *racemosum*	False Solomon's Seal	4	3		S5			G5T	X
Maianthemum	*stellatum*	Star-flowered Solomon's Seal	6	1		S5			G5	X
Maianthemum	*trifolium*	Three-leaved Solomon's Seal	10	-5		S5			G5	R
Polygonatum	*biflorum*	Hairy Solomon's Seal	8	3		S4			G5	R
Polygonatum	*pubescens*	Hairy Solomon's Seal	5	5		S5			G5	X
Streptopus	*roseus*	Rose Twisted-stalk	7	0		S5			G5	RH
Trillium	*grandiflorum*	White Trillium	5	5		S5			G5	X
Uvularia	*grandiflora*	Large-flowered Bellwort	6	5		S5			G5	X
Poaceae		**Grass Family**								
Alopecurus	*aequalis*	Water Foxtail		-5		S4S5			G5	R
Brachyelytrum	*species*									
Bromus	*inermis* ssp. *inermis*	Awnless Brome		5	-3	SE5			G4G5T?	I
Bromus	*japonicus*	Japanese Chess		3	-1	SE4			G?	I?
Calamagrostis	*canadensis var. canadensis*	Blue-joint Grass	4	-5						X
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5			G?	I
Digitaria	*species*									
Echinochloa	*species*									
Echinochloa	*muricata var. microstachya*	Small-spiked Barnyard Grass	6	-2		S4S5			G5T5	R
Elymus	*hystrix*	Bottle-brush Grass	5	5		S5			G5	X
Elymus	*virginicus* var. *virginicus*	Virginia Wild Rye	5	-2		S5			G5T5	X
Glyceria	*grandis var. grandis*	Tall Manna Grass	5	-5		S4S5			G5	X
Glyceria	*striata*	Fowl Meadow Grass	3	-5		S4S5			G5T5	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
Leersia	*oryzoides*	Rice Cut Grass	3	-5		S5			G5	X
Leersia	*virginica*	White Cut Grass	6	-3		S4			G5	X
Muhlenbergia	*asperifolia*	Scratch Grass		5	-1	SE3			G5	
Panicum	*species*									
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5			G5	X
Phleum	*pratense ssp. pratense*	Timothy		3	-1	SE5			G?	I
Phragmites	*australis ssp. australis*	European Reed				SNR			GNR	
Poa	*species*									
Poa	*alsodes*	Grove Meadow Grass	7	-2		S4			G4G5	R
Poa	*palustris*	Fowl Meadow Grass	5	-4		S5			G5	X
Poa	*pratensis* ssp. *pratensis*	Kentucky Bluegrass	0	1		S5			G5T5	X
Schedonorus	*arundinaceus*	Tall Fescue		2	-1	SE5			G?	I
Setaria	*pumila ssp. pumila*	Yellow Foxtail		0	-1	SE5			G?	I
Pontederiaceae		**Pickerel-weed Family**								
Pontederia	*cordata*	Heart-leaved Pickerel-weed	7	-5		S5			G5	R
Smilacaceae		**Catbrier Family**								
Smilax	*species*									
Smilax	*herbacea*	Herbaceous Carrion Flower	5	0		S4			G5	X
Smilax	*hispida*	Bristly Greenbrier	6	0		S4			G5Q	X
Sparganiaceae		**Bur-reed Family**								
Sparganium	*species*									
Sparganium	*americanum*	Nuttall's Bur-reed	8	-3		S4?			G5	R
Typhaceae		**Cattail Family**								
Typha	*angustifolia*	Narrow-leaved Cattail	3	-5		S5			G5	X
Typha	*latifolia*	Broad-leaved Cattail	3	-5		S5			G5	X
Typha X	*glauca*	Glaucous Cattail	3	-5		S5			HYB	X

Appendix G
Plant List

LATIN NAME	LOCAL STATUS SOURCE	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS NIAG
FLORISTIC SUMMARY & ASSESSMENT										
Species Diversity										
Total Species:		**378**								
Native Species:		**285**	75%							
Exotic Species		**93**	25%							
Regionally Significant Species	*(Niagara Region)*	25	9%							
Locally Significant Species		N/A								
S1-S3 Species		5	2%							
S4 Species		32	11%							
S5 Species		244	87%							
Co-efficient of Conservatism and Floristic Quality Index										
Co-efficient of Conservatism (CC) (average)		**4.7**								
CC 0 to 3	*lowest sensitivity*	78	28%							
CC 4 to 6	*moderate sensitivity*	152	54%							
CC 7 to 8	*high sensitivity*	42	15%							
CC 9 to 10	*highest sensitivity*	7	3%							
Floristic Quality Index (FQI)		**78**								
Presence of Weedy & Invasive Species										
mean weediness		**-1.7**								
weediness = -1	*low potential invasiveness*	43	49%							
weediness = -2	*moderate potential invasiveness*	25	28%							
weediness = -3	*high potential invasiveness*	20	23%							
Presence of Wetland Species										
average wetness value		**0.5**								
upland		83	22%							
facultative upland		91	24%							
facultative		63	17%							
facultative wetland		79	21%							
obligate wetland		56	15%							

Appendix H

Wildlife List

Appendix H
Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	COMMENTS
BUTTERFLIES									
Cabbage White	*Pieris rapae*	SNA	G5						
Canadian Tiger Swallowtail	*Papilio canadensis*	S5	G5						
Monarch	*Danaus plexippus*	S4B, S2N	G5	SC	SC				
Red Admiral	*Vanessa atalanta*	S5	G5						
AMPHIBIANS									
American Toad	*Anaxyrus americanus*	S5	G5						
Bullfrog	*Lithobates catesbeiana*	S4	G5						
Northern Green Frog	*Lithobates clamitans*	S5	G5					X	
Northern Leopard Frog	*Lithobates pipiens*	S5	G5	NAR	NAR				
Spring Peeper	*Pseudacris crucifer*	S5	G5						
Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5						
Western Chorus Frog (carolinian)	*Pseudacris triseriata*	S4	G5	NAR	NAR				
Wood Frog	*Lithobates sylvatica*	S5	G5						
REPTILES									
Blanding's Turtle	*Emydoidea blandingi*	S3	G4	THR	THR				
Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5						
Midland Painted Turtle	*Chrysemys picta marginata*	S5	G5T5				7		
BIRDS									
Alder Flycatcher	*Empidonax alnorum*	S5B	G5						Observed in migration only
American Bittern	*Botaurus lentiginosus*	S4B	G4						Observed in migration only
American Crow	*Corvus brachyrhynchos*	S5B	G5						Observed in migration only
American Goldfinch	*Carduelis tristis*	S5B	G5						Observed in migration only
American Kestrel	*Falco sparverius*	S5B	G5						
American Pipit	*Anthus rubescens*	S4	G5						Observed in migration only
American Redstart	*Setophaga ruticilla*	S5B	G5			20-30			Observed in migration only
American Robin	*Turdus migratorius*	S5B	G5						Observed in migration only
American Tree Sparrow	*Spizella arborea*	S4B	G5						Observed in migration only
American Woodcock	*Scolopax minor*	S4B	G5						Observed in migration only
Bald Eagle	*Haliaeetus leucocephalus*	S2N,S4B	G4	SC	NAR				Observed in migration only
Baltimore Oriole	*Icterus galbula*	S4B	G5						Observed in migration only

Appendix H
Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	COMMENTS
Barn Swallow	*Hirundo rustica*	S4B	G5		THR-NS				Observed in migration only
Bay-breasted Warbler	*Setophaga castanea*	S5B	G5				6		Observed in migration only
Belted Kingfisher	*Ceryle alcyon*	S4B	G5						Observed in migration only
Black-and-white Warbler	*Mniotilta varia*	S5B	G5			100			Observed in migration only
Black-billed Cuckoo	*Coccyzus erythropthalmus*	S5B	G5						
Blackburnian Warbler	*Setophaga fusca*	S5B	G5			30-50	7		Observed in migration only
Black-capped Chickadee	*Poecile atricapillus*	S5	G5						Observed in migration only
Blackpoll Warbler	*Setophaga striata*	S4B	G5						Observed in migration only
Black-throated Blue Warbler	*Setophaga caerulescens*	S5B	G5			30-50			Observed in migration only
Black-throated Green Warbler	*Setophaga virens*	S5B	G5			30			Observed in migration only
Blue Jay	*Cyanocitta cristata*	S5	G5						Observed in migration only
Blue-gray Gnatcatcher	*Polioptila caerulea*	S4B	G5						Observed in migration only
Blue-headed Vireo	*Vireo solitarius*	S5B	G5			100	6,7		Observed in migration only
Blue-winged Warbler	*Vermivora cyanoptera*	S4B	G5						Observed in migration only
Bobolink	*Dolichonyx oryzivorus*	S4B	G5	THR	THR-NS				
Boreal Chickadee	*Poecile hudsonica*	S5	G5						Observed in migration only
Brown Creeper	*Certhia americana*	S5B	G5			30			Observed in migration only
Brown Thrasher	*Toxostoma rufum*	S4B	G5						Observed in migration only
Brown-headed Cowbird	*Molothrus ater*	S4B	G5						Observed in migration only
Canada Goose	*Branta canadensis*	S5	G5						Observed in migration only
Canada Warbler	*Cardellina canadensis*	S4B	G5	SC	THR	30			Observed in migration only
Cape May Warbler	*Setophaga tigrina*	S5B	G5				6		Observed in migration only
Carolina Wren	*Thryothorus ludovicianus*	S4	G5						Observed in migration only
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5						Observed in migration only
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B	G5						Observed in migration only
Chimney Swift	*Chaetura pelagica*	S4B, S4N	G5	THR	THR				Observed in migration only
Chipping Sparrow	*Spizella passerina*	S5B	G5						Observed in migration only
Common Grackle	*Quiscalus quiscula*	S5B	G5						Observed in migration only
Common Loon	*Gavia immer*	S5B,S5N	G5	NAR	NAR				Observed in migration only
Common Moorhen									
Common Yellowthroat	*Geothlypis trichas*	S5B	G5						Observed in migration only
Cooper's Hawk	*Accipiter cooperii*	S4	G5	NAR	NAR	4-50+			Observed in migration only
Dark-eyed Junco	*Junco hyemalis*	S5B	G5				7		Observed in migration only
Double-crested Cormorant	*Phalacrocorax auritus*	S5B	G5	NAR	NAR				Observed in migration only
Downy Woodpecker	*Picoides pubescens*	S5	G5						Observed in migration only
Eastern Bluebird	*Sialia sialis*	S5B	G5	NAR	NAR				Observed in migration only

Appendix H
Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	COMMENTS
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5						
Eastern Phoebe	*Sayornis phoebe*	S5B	G5						Observed in migration only
Eastern Towhee	*Pipilo erythrophthalmus*	S4B	G5						Observed in migration only
Eastern Wood-Pewee	*Contopus virens*	S4B	G5						Observed in migration only
European Starling	*Sturnus vulgaris*	SNA	G5						Observed in migration only
Field Sparrow	*Spizella pusilla*	S4B	G5				7		Observed in migration only
Fox Sparrow	*Passerella iliaca*	S4B	G5						Observed in migration only
Golden Eagle	*Aquila chrysaetos*	S2B	G5	END	NAR				
Golden-crowned Kinglet	*Regulus satrapa*	S5B	G5			0	7	X	Observed in migration only
Gray Catbird	*Dumetella carolinensis*	S4B	G5						Observed in migration only
Gray-cheeked Thrush	*Catharus minimus*	S2S4B	G5						Observed in migration only
Great Blue Heron	*Ardea herodias*	S5	G5						Observed in migration only
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5						Observed in migration only
Great Horned Owl	*Bubo virginianus*	S5	G5						
Greater Yellowlegs	*Tringa melanoleuca*	S4B,S4N	G5						Observed in migration only
Green Heron	*Butorides virescens*	S4B	G5						
Green-winged Teal	*Anas crecca*	S4	G5				6		Observed in migration only
Hairy Woodpecker	*Picoides villosus*	S5	G5			10			Observed in migration only
Hermit Thrush	*Catharus guttatus*	S5B	G5			20-30	7		Observed in migration only
Horned Lark	*Eremophila alpestris*	S5B	G5						Observed in migration only
House Sparrow	*Passer domesticus*	SNA	G5						
House Wren	*Troglodytes aedon*	S5B	G5						Observed in migration only
Indigo Bunting	*Passerina cyanea*	S4B	G5						Observed in migration only
Killdeer	*Charadrius vociferus*	S5B, S5N	G5						Observed in migration only
Least Flycatcher	*Empidonax minimus*	S4B	G5						Observed in migration only
Magnolia Warbler	*Setophaga magnolia*	S5B	G5			30	7		Observed in migration only
Mallard	*Anas platyrhynchos*	S5	G5						Observed in migration only
Merlin	*Falco columbarius*	S5B	G5	NAR	NAR		6		Observed in migration only
Mourning Dove	*Zenaida macroura*	S5	G5						Observed in migration only
Mourning Warbler	*Geothlypis philadelphia*	S4B	G5			10			Observed in migration only
Nashville Warbler	*Oreothlypis ruficapilla*	S5B	G5						Observed in migration only
Northern Cardinal	*Cardinalis cardinalis*	S5	G5						Observed in migration only
Northern Flicker	*Colaptes auratus*	S4B	G5						Observed in migration only
Northern Goshawk	*Accipiter gentilis*	S4	G5	NAR	NAR				Observed in migration only
Northern Harrier	*Circus cyaneus*	S4B	G5	NAR	NAR	55			Observed in migration only
Northern Mockingbird	*Mimus polyglottos*	S4	G5						

Appendix H
Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	COMMENTS
Northern Parula	*Setophaga americana*	S4B	G5			100	6,7		Observed in migration only
Northern Pintail	*Anas acuta*	S5	G5						Observed in migration only
Northern Shrike	*Lanius excubitor*	SNA	G5						
Northern Waterthrush	*Parkesia noveboracensis*	S5B	G5			20			Observed in migration only
Olive-sided Flycatcher	*Contopus borealis*	S4B	G5	SC	THR		6		Observed in migration only
Orange-crowned Warbler	*Oreothlypis celata*	S4B	G5						Observed in migration only
Ovenbird	*Seiurus aurocapilla*	S4B	G5			20			Observed in migration only
Palm Warbler	*Setophaga palmarum*	S5B	G5				6		Observed in migration only
Philadelphia Vireo	*Vireo philadelphicus*	S5B	G5				6	X	Observed in migration only
Pileated Woodpecker	*Dryocopus pileatus*	S5	G5			30-50*			Observed in migration only
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5						Observed in migration only
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5						Observed in migration only
Red-shouldered Hawk	*Buteo lineatus*	S4B	G5		NAR	50-70			
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	NAR	NAR				Observed in migration only
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5						Observed in migration only
Ring-billed Gull	*Larus delawarensis*	S5B,S4N	G5						Observed in migration only
Rock Pigeon	*Columba livia*	SNA	G5						
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5						Observed in migration only
Rough-legged Hawk	*Buteo lagopus*	S1B, S4N	G5	NAR	NAR				
Ruby-crowned Kinglet	*Regulus calendula*	S4B	G5				6,7		Observed in migration only
Ruby-throated Hummingbird	*Archilochus colubris*	S5B	G5						Observed in migration only
Rusty Blackbird	*Euphagus carolinus*	S4B	G5		SC		6		Observed in migration only
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5						Observed in migration only
Scarlet Tanager	*Piranga olivacea*	S4B	G5			20			Observed in migration only
Sharp-shinned Hawk	*Accipiter striatus*	S5	G5	NAR	NAR	20-30			Observed in migration only
Short-eared Owl	*Asio flammeus*	S2N, S4B	G5	SC	SC-3	75			
Snowy Owl	*Bubo scandiaca*	SNA	G5	NAR	NAR			X	
Song Sparrow	*Melospiza melodia*	S5B	G5						Observed in migration only
Sora	*Porzana carolina*	S4B	G5			30			
Spotted Sandpiper	*Actitis macularia*	S5	G5						Observed in migration only
Swainson's Thrush	*Catharus ustulatus*	S4B	G5				6		Observed in migration only
Swamp Sparrow	*Melospiza georgiana*	S5B	G5						Observed in migration only
Tennessee Warbler	*Oreothlypis peregrina*	S5B	G5				6		Observed in migration only
Tree Swallow	*Tachycineta bicolor*	S4B	G5						Observed in migration only
Tufted Titmouse	*Baeolophus bicolor*	S4	G5						Observed in migration only
Turkey Vulture	*Cathartes aura*	S5B	G5						Observed in migration only

Appendix H
Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	COMMENTS
Veery	*Catharus fuscescens*	S4B	G5			10-20			Observed in migration only
Vesper Sparrow	*Pooecetes gramineus*	S4B	G5						Observed in migration only
Virginia Rail	*Rallus limicola*	S5B	G5						
Warbling Vireo	*Vireo gilvus*	S5B	G5						Observed in migration only
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5			10			Observed in migration only
White-crowned Sparrow	*Zonotrichia leucophrys*	S4B	G5						Observed in migration only
White-throated Sparrow	*Zonotrichia albicollis*	S5B	G5			20			Observed in migration only
Wild Turkey	*Meleagris gallopava*	S5	G5						Observed in migration only
Willow Flycatcher	*Empidonax traillii*	S5B	G5						Observed in migration only
Wilson's Warbler	*Cardellina pusilla*	S4B	G5				6		Observed in migration only
Winter Wren	*Troglodytes hiemalis*	S5B	G5			30			Observed in migration only
Wood Duck	*Aix sponsa*	S5	G5						Observed in migration only
Wood Thrush	*Hylocichla mustelina*	S4B	G5						Observed in migration only
Yellow Warbler	*Setophaga petechia*	S5B	G5						Observed in migration only
Yellow-bellied Flycatcher	*Empidonax flaviventris*	S5B	G5				6		Observed in migration only
Yellow-bellied Sapsucker	*Sphyrapicus varius*	S5B	G5			30-50			Observed in migration only
Yellow-billed Cuckoo	*Coccyzus americanus*	S4B	G5				6		Observed in migration only
Yellow-rumped Warbler	*Setophaga coronata*	S5B	G5				7		Observed in migration only
MAMMALS									
Coyote	*Canis latrans*	S5	G5						
Eastern Chipmunk	*Tamias striatus*	S5	G5						
Eastern Cottontail	*Sylvilagus floridanus*	S5	G5						
Grey Squirrel	*Sciurus carolinensis*	S5	G5						
Mink	*Mustela vison*	S4	G5			10			
Raccoon	*Procyon lotor*	S5	G5						
Red Squirrel	*Tamiasciurus hudsonicus*	S5	G5			30			
White-tailed Deer	*Odocoileus virginianus*	S5	G5						

Appendix H
Wildlife List

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	COMMENTS

SUMMARY

Total Butterflies:	4
Total Amphibians:	8
Total Reptiles:	3
Total Birds:	138
Total Breeding Birds:	138
Total Mammals:	8

SIGNIFICANT SPECIES

Global:	0
National:	9
Provincial:	11
Regional:	11
Local:	4

Appendix I

Breeding Bird List

Appendix I
Breeding Birds Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	Comments
Canada Goose	*Branta canadensis*	S5	G5						
Mallard	*Anas platyrhynchos*	S5	G5						
Wild Turkey	*Meleagris gallopava*	S5	G5						
Great Blue Heron	*Ardea herodias*	S5	G5						
Green Heron	*Butorides virescens*	S4B	G5						
Turkey Vulture	*Cathartes aura*	S5B	G5						
Red-shouldered Hawk	*Buteo lineatus*	S4B	G5		NAR	50-70		X	
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	NAR	NAR				
American Kestrel	*Falco sparverius*	S5B	G5					X	
Sora	*Porzana carolina*	S4B	G5						
Killdeer	*Charadrius vociferus*	S5B, S5N	G5						
Spotted Sandpiper	*Actitis macularia*	S5	G5						
American Woodcock	*Scolopax minor*	S4B	G5						
Ring-billed Gull	*Larus delawarensis*	S5B,S4N	G5						
Caspian Tern	*Hydroprogne caspia*	S3B	G5	NAR	NAR				
Rock Pigeon	*Columba livia*	SNA	G5						
Mourning Dove	*Zenaida macroura*	S5	G5						
Yellow-billed Cuckoo	*Coccyzus americanus*	S4B	G5						
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S4B	G5	SC	THR			X	
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5						
Downy Woodpecker	*Picoides pubescens*	S5	G5						
Northern Flicker	*Colaptes auratus*	S4B	G5					X	
Pileated Woodpecker	*Dryocopus pileatus*	S5	G5			30-50*			
Eastern Wood-Pewee	*Contopus virens*	S4B	G5					X	
Willow Flycatcher	*Empidonax traillii*	S5B	G5					X	
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5						
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5					X	
Warbling Vireo	*Vireo gilvus*	S5B	G5						
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5						
Blue Jay	*Cyanocitta cristata*	S5	G5						
American Crow	*Corvus brachyrhynchos*	S5B	G5						
Common Raven	*Corvus corax*	S5	G5				6		
Horned Lark	*Eremophila alpestris*	S5B	G5						
Purple Martin	*Progne subis*	S4B	G5						
Tree Swallow	*Tachycineta bicolor*	S4B	G5						
Bank Swallow	*Riparia riparia*	S4B	G5					X	

Appendix I
Breeding Birds Wildlife List

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	ECO REGION (OWES)	Local Status PIF Priority Species (BCR 13)	Comments
Barn Swallow	*Hirundo rustica*	S4B	G5		THR-NS				Addressed separately through ESA requirements for the MNR
Black-capped Chickadee	*Poecile atricapillus*	S5	G5						
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5			10			
House Wren	*Troglodytes aedon*	S5B	G5						
Eastern Bluebird	*Sialia sialis*	S5B	G5	NAR	NAR				
Veery	*Catharus fuscescens*	S4B	G5			10-20			
Wood Thrush	*Hylocichla mustelina*	S4B	G5					X	
American Robin	*Turdus migratorius*	S5B	G5						
Gray Catbird	*Dumetella carolinensis*	S4B	G5						
Northern Mockingbird	*Mimus polyglottos*	S4	G5						
Brown Thrasher	*Toxostoma rufum*	S4B	G5					X	
European Starling	*Sturnus vulgaris*	SNA	G5						
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5						
Yellow Warbler	*Dendroica petechia*	S5B	G5						
Common Yellowthroat	*Geothlypis trichas*	S5B	G5						
Eastern Towhee	*Pipilo erythrophthalmus*	S4B	G5					X	
Chipping Sparrow	*Spizella passerina*	S5B	G5						
Field Sparrow	*Spizella pusilla*	S4B	G5					X	
Vesper Sparrow	*Pooecetes gramineus*	S4B	G5					X	
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5					X	
Song Sparrow	*Melospiza melodia*	S5B	G5						
Northern Cardinal	*Cardinalis cardinalis*	S5	G5						
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5					X	
Indigo Bunting	*Passerina cyanea*	S4B	G5						
Bobolink	*Dolichonyx oryzivorus*	S4B	G5	THR	THR-NS	10		X	Addressed separately through ESA requirements for the MNR
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5						
Eastern Meadowlark	*Sturnella magna*	S4B	G5		THR-NS			X	Addressed separately through ESA requirements for the MNR
Common Grackle	*Quiscalus quiscula*	S5B	G5						
Brown-headed Cowbird	*Molothrus ater*	S4B	G5						
Baltimore Oriole	*Icterus galbula*	S4B	G5					X	
American Goldfinch	*Carduelis tristis*	S5B	G5						
House Sparrow	*Passer domesticus*	SNA	G5						

AppendixJ

Migratory Landbird Results

Appendix J
Spring and Fall Migratory Landbird Results

	Spring Transects		Fall Transects	
Candidate Significant wildlife habitat	total # species	total # of Birds	total # species	Total # of birds
mlsa1	68	469	69	1174
mlsa2	73	890	64	698
mlsa3	71	701		
mlsa4	60	482		
mlsa5	54	345		
mlsa6	44	171		

SURVEY RESULTS MLSA1

Spring 2012 species	number of birds	COSSARO	COSEWIC	ONTARIO STATUS (S3-S1)	Fall 2011 species	number of birds	COSSARO	COSEWIC	ONTARIO STATUS (S1-S3)
American Robin	74				Red-winged Blackbird	466			
Red-winged Blackbird	54				White-throated Sparrow	100			
Song Sparrow	34				European Starling	79			
Rusty Blackbird	30		SC		Song Sparrow	54			
Yellow Warbler	28				Brown-headed Cowbird	51			
Double-crested Cormorant	20				American Robin	48			
Brown-headed Cowbird	16				Black-capped Chickadee	44			
Rose-breasted Grosbeak	14				American Crow	33			
American Crow	10				Blue Jay	26			
American Redstart	10				Gray Catbird	21			
Black-capped Chickadee	8				Canada Goose	20			
Cedar Waxwing	8				Yellow-rumped Warbler	18			
Wood Duck	8				Golden-crowned Kinglet	14			
Canada Goose	7				Downy Woodpecker	12	NAR	NAR	
Dark-eyed Junco	7				Common Grackle	11			
Gray Catbird	7				Red-eyed Vireo	9			
Northern Pintail	7				Swainson's Thrush	9			
Wood Thrush	7				Mourning Dove	9			
American Goldfinch	6				Black-throated Green Warbler	8			
Mourning Dove	6				Common Yellowthroat	7			
Northern Cardinal	6				Magnolia Warbler	7			
Red-bellied Woodpecker	6				Rusty Blackbird	6		SC	
White-crowned Sparrow	6				Northern Flicker	6			
Barn Swallow	5	THR	THR-NS		White-breasted Nuthatch	6			
Ovenbird	5				Northern Cardinal	6			
White-winged Crossbill	5				Dark-eyed Junco	5			
Yellow-bellied Sapsucker	5				Ruby-crowned Kinglet	5			
Blue Jay	4				Blackpoll Warbler	5			
Downy Woodpecker	4				Nashville Warbler	5			
Northern Flicker	4				Great Blue Heron	5			
Blackpoll Warbler	3				Wood Duck	5			
Common Grackle	3				American Goldfinch	4			
Indigo Bunting	3				Hairy Woodpecker	4			
Least Flycatcher	3				Eastern Wood-Pewee	4			
Mallard	3				Black-and-white Warbler	4			
Baltimore Oriole	2				Swamp Sparrow	3			
Black-throated Blue Warbler	2				American Redstart	3			
European Starling	2				Red-bellied Woodpecker	3			
Great Crested Flycatcher	2				Blackburnian Warbler	3			
Hairy Woodpecker	2				Yellow-bellied Sapsucker	3			
House Wren	2				Cooper's Hawk	3	NAR	NAR	
Magnolia Warbler	2				Horned Lark	3			
Red-eyed Vireo	2				Killdeer	3			
Vesper Sparrow	2				House Wren	2			
Yellow-rumped Warbler	2				Philadelphia Vireo	2			
Blackburnian Warbler	1				Gray-cheeked Thrush	2			S2S4B
Blue-headed Vireo	1				Eastern Towhee	2			
Brown Creeper	1				Merlin	2	NAR	NAR	
Canada Warbler	1	SC	THR		Pileated Woodpecker	2			
Chestnut-sided Warbler	1				Tufted Titmouse	2			
Chimney Swift	1	THR	THR		Veery	2			
Chipping Sparrow	1				Rose-breasted Grosbeak	1			
Common Goldeneye	1				Red-tailed Hawk	1	NAR	NAR	
Common Yellowthroat	1				Winter Wren	1			
Eastern Wood-Pewee	1				Blue-headed Vireo	1			
Great Blue Heron	1				Least Flycatcher	1			
Hermit Thrush	1				Northern Harrier	1	NAR	NAR	
Killdeer	1				Orange-crowned Warbler	1			
Mourning Warbler	1				Sharp-shinned Hawk	1	NAR	NAR	
Northern Parula	1				White-crowned Sparrow	1			
Northern Waterthrush	1				Bay-breasted Warbler	1			
Pileated Woodpecker	1				Blue-winged Warbler	1			
Spotted Sandpiper	1				Canada Warbler	1	SC	THR	
Swainson's Thrush	1				Carolina Wren	1			
Warbling Vireo	1				Cedar Waxwing	1			
Wilson's Phalarope	1				Northern Waterthrush	1			
Wilson's Warbler	1				Ovenbird	1			
Yellow-billed Cuckoo	1				Turkey Vulture	1			
Total: 69 species	469 Birds				Wood Thrush	1			
					Total: 70 Species	1174 Birds			

Appendix J
Spring and Fall Migratory Landbird Results

SURVEY RESULTS MLSA2

Spring 2012 species	number of birds	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC
Red-winged Blackbird	117			
Rusty Blackbird	100			SC
Ring-billed Gull	84			
American Robin	73			
European Starling	54			
Common Goldeneye	44			
Song Sparrow	43			
White-winged Crossbill	39			
Brown-headed Cowbird	24			
Canada Goose	22			
Yellow Warbler	22			
American Goldfinch	21			
White-eyed Vireo	18	S2B		
Black-capped Chickadee	16			
Cedar Waxwing	15			
Mallard	12			
Brown Creeper	10			
Northern Flicker	10			
Chipping Sparrow	9			
Gray Catbird	9			
Wood Duck	9			
American Redstart	8			
Common Yellowthroat	8			
Rose-breasted Grosbeak	8			
American Crow	6			
Baltimore Oriole	6			
Blackpoll Warbler	6			
Warbling Vireo	6			
Wood Thrush	6			
Yellow-bellied Sapsucker	6			
Downy Woodpecker	5			
Great Crested Flycatcher	5			
Killdeer	5			
Hermit Thrush	4			
Eastern Wood-Pewee	3			
Palm Warbler	3			
Red-tailed Hawk	3			
Ruby-crowned Kinglet	3			
American Woodcock	2			
Belted Kingfisher	2			
Blue Jay	2			
Blue-gray Gnatcatcher	2			
Eastern Phoebe	2			
House Wren	2			
Indigo Bunting	2			
Mourning Dove	2			
Northern Waterthrush	2			
Red-eyed Vireo	2			
Swamp Sparrow	2			
Tree Swallow	2			
Vesper Sparrow	2			
American Tree Sparrow	1			
Black-throated Blue Warbler	1			
Black-throated Green Warbler	1			
Blue-headed Vireo	1			
Blue-winged Warbler	1			
Canada Warbler	1		SC	THR
Cape May Warbler	1			
Dark-eyed Junco	1			
Fox Sparrow	1			
Golden-crowned Kinglet	1			
Gray-cheeked Thrush	1	S2S4B		
Greater Yellowlegs	1			
Nashville Warbler	1			
Northern Cardinal	1			
Northern Parula	1			
Pileated Woodpecker	1			
Scarlet Tanager	1			
Tufted Titmouse	1			
Turkey Vulture	1			
White-crowned Sparrow	1			
Wilson's Phalarope	1			
Winter Wren	1			
Total: 73 Species	890 Birds			

Fall 2011 species	number of birds	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC
Red-winged Blackbird	136			
Yellow-rumped Warbler	63			
American Robin	61			
White-throated Sparrow	45			
Blue Jay	41			
European Starling	34			
Rusty Blackbird	30			SC
Black-capped Chickadee	28			
Dark-eyed Junco	26			
Song Sparrow	23			
Northern Flicker	20			
Downy Woodpecker	16		NAR	NAR
American Crow	13			
American Goldfinch	11			
Red-eyed Vireo	10			
Swainson's Thrush	8			
Ruby-crowned Kinglet	7			
Tree Swallow	7			
Common Yellowthroat	6			
Magnolia Warbler	6			
Blackpoll Warbler	6			
Hairy Woodpecker	6			
Gray Catbird	5			
Common Grackle	5			
Swamp Sparrow	5			
House Wren	5			
Golden-crowned Kinglet	4			
White-breasted Nuthatch	4			
Eastern Wood-Pewee	4			
American Redstart	4			
Rose-breasted Grosbeak	4			
Black-throated Green Warbler	3			
Black-and-white Warbler	3			
Red-bellied Woodpecker	3			
Philadelphia Vireo	3			
Brown Creeper	3			
Palm Warbler	3			
Canada Goose	2			
Mourning Dove	2			
Nashville Warbler	2			
Blackburnian Warbler	2			
Yellow-bellied Sapsucker	2			
Red-tailed Hawk	2		NAR	NAR
Winter Wren	2			
Northern Parula	2			
Ruby-throated Hummingbird	2			
Yellow-bellied Flycatcher	2			
Gray-cheeked Thrush	1	S2S4B		
Blue-headed Vireo	1			
Least Flycatcher	1			
Northern Harrier	1		NAR	NAR
Orange-crowned Warbler	1			
Sharp-shinned Hawk	1		NAR	NAR
White-crowned Sparrow	1			
American Pipit	1			
Black-throated Blue Warbler	1			
Cape May Warbler	1			
Eastern Phoebe	1			
Hermit Thrush	1			
Indigo Bunting	1			
Olive-sided Flycatcher	1		SC	THR
Scarlet Tanager	1			
Tennessee Warbler	1			
Wilson's Warbler	1			
Total :64 Species	698 Birds			

Appendix J
Spring and Fall Migratory Landbird Results

SURVEY RESULTS MLSA3

Spring 2012 Species	Total number of birds	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC
Red-winged Blackbird	63			
American Robin	61			
Rusty Blackbird	44			SC
Song Sparrow	44			
Yellow Warbler	41			
Common Goldeneye	40			
American Goldfinch	35			
Brown-headed Cowbird	32			
Black-capped Chickadee	25			
American Crow	24			
White-winged Crossbill	24			
Common Yellowthroat	21			
Eastern Towhee	17			
Golden-crowned Kinglet	15			
Ring-billed Gull	14			
Blue Jay	12			
Gray Catbird	11			
Canada Goose	10			
Field Sparrow	8			
Green-winged Teal	8			
American Tree Sparrow	7			
Brown Creeper	6			
Chipping Sparrow	6			
Northern Cardinal	6			
Wood Duck	6			
American Redstart	5			
Brown Thrasher	5			
House Wren	5			
Northern Flicker	5			
Rose-breasted Grosbeak	5			
Ruby-crowned Kinglet	5			
Vesper Sparrow	5			
Wilson's Phalarope	5			
Blue-headed Vireo	4			
Great Crested Flycatcher	4			
Hermit Thrush	4			
Indigo Bunting	4			
Mallard	4			
Pileated Woodpecker	4			
Red-tailed Hawk	4			
Yellow-rumped Warbler	4			
Baltimore Oriole	3			
Black-throated Green Warbler	3			
Cedar Waxwing	3			
Hairy Woodpecker	3			
Mourning Dove	3			
Willow Flycatcher	3			
Wood Thrush	3			
European Starling	2			
Least Flycatcher	2			
Ovenbird	2			
Savannah Sparrow	2			
Winter Wren	2			
Alder Flycatcher	1			
American Bittern	1			
Black-and-white Warbler	1			
Blackpoll Warbler	1			
Blue-gray Gnatcatcher	1			
Chestnut-sided Warbler	1			
Common Grackle	1			
Downy Woodpecker	1			
Gray-cheeked Thrush	1	S2S4B		
Great Blue Heron	1			
Horned Lark	1			
Northern Goshawk	1			
Northern Waterthrush	1			
Red-bellied Woodpecker	1			
Swainson's Thrush	1			
Swamp Sparrow	1			
Warbling Vireo	1			
Yellow-bellied Sapsucker	1			
Total: 71 Species	701 Birds			

Appendix J
Spring and Fall Migratory Landbird Results

SURVEY RESULTS MLSA4

Spring 2012 Species	Total number of Birds	ONTARIO STATUS (S3-S1)	COSSARO	COSEWIC
Yellow Warbler	55			
American Robin	47			
Song Sparrow	28			
Black-capped Chickadee	24			
Brown-headed Cowbird	24			
American Redstart	19			
Northern Flicker	16			
House Wren	14			
Northern Cardinal	14			
Common Goldeneye	13			
Common Yellowthroat	12			
Gray Catbird	12			
Rose-breasted Grosbeak	12			
Rusty Blackbird	12			SC
European Starling	11			
Hairy Woodpecker	10			
Red-winged Blackbird	10			
Downy Woodpecker	9			
White-winged Crossbill	9			
American Crow	8			
American Goldfinch	8			
Blue Jay	6			
Cedar Waxwing	6			
Red-eyed Vireo	6			
White-crowned Sparrow	6			
Black-throated Green Warbler	5			
Mallard	5			
Mourning Dove	5			
Tennessee Warbler	5			
Warbling Vireo	5			
Wood Thrush	5			
Blackburnian Warbler	4			
Red-tailed Hawk	4			
Ring-billed Gull	4			
Black-throated Blue Warbler	3			
Blue-gray Gnatcatcher	3			
Boreal Chickadee	3			
Canada Goose	3			
Great Crested Flycatcher	3			
Magnolia Warbler	3			
Ovenbird	3			
Wood Duck	3			
Baltimore Oriole	2			
Barn Swallow	2		THR	THR-NS
Bay-breasted Warbler	2			
Dark-eyed Junco	2			
Ruby-crowned Kinglet	2			
Savannah Sparrow	2			
Yellow-rumped Warbler	2			
Blackpoll Warbler	1			
Eastern Bluebird	1			
Eastern Wood-Pewee	1			
Indigo Bunting	1			
Least Flycatcher	1			
Nashville Warbler	1			
Northern Waterthrush	1			
Red-bellied Woodpecker	1			
Turkey Vulture	1			
Willow Flycatcher	1			
Wilson's Phalarope	1			
Total: 60 species	482 Birds			

Appendix J
Spring and Fall Migratory Landbird Results

SURVEY RESULTS MLSA5

Spring 2012 species	Total number of Birds	COSSARO	COSEWIC	ONTARIO STATUS (S3-S1)
Rusty Blackbird	71		SC	
American Crow	25			
Red-winged Blackbird	24			
American Goldfinch	22			
American Robin	18			
Common Goldeneye	18			
Red-eyed Vireo	17			
Black-capped Chickadee	14			
Northern Cardinal	10			
Blue Jay	9			
Yellow Warbler	9			
Ring-billed Gull	8			
Song Sparrow	8			
Downy Woodpecker	7			
Brown-headed Cowbird	6			
Wood Duck	6			
Wood Thrush	6			
Northern Flicker	5			
Rose-breasted Grosbeak	5			
Baltimore Oriole	4			
Great Crested Flycatcher	4			
Ruby-crowned Kinglet	4			
Blackpoll Warbler	3			
Brown Creeper	3			
Mallard	3			
Gray Catbird	2			
Indigo Bunting	2			
Killdeer	2			
Swamp Sparrow	2			
Turkey Vulture	2			
Vesper Sparrow	2			
White-crowned Sparrow	2			
American Redstart	1			
Bald Eagle	1	SC	NAR	S2B,S4N
Black-and-white Warbler	1			
Blackburnian Warbler	1			
Common Yellowthroat	1			
Eastern Phoebe	1			
Eastern Wood-Pewee	1			
Hairy Woodpecker	1			
Hermit Thrush	1			
Mourning Warbler	1			
Northern Parula	1			
Northern Waterthrush	1			
Ovenbird	1			
Pileated Woodpecker	1			
Red-bellied Woodpecker	1			
Red-tailed Hawk	1			
Veery	1			
Warbling Vireo	1			
White-winged Crossbill	1			
Willow Flycatcher	1			
Yellow-bellied Sapsucker	1			
Yellow-rumped Warbler	1			
Total: 54 Species	345 Birds			

Appendix J
Spring and Fall Migratory Landbird Results

SURVEY RESULTS MLSA6

Spring 2012 Species	Total number of Birds	COSSARO	COSEWIC	ONTARIO STATUS (S3-S1)
Blue Jay	17			
American Goldfinch	14			
American Robin	13			
American Redstart	8			
Black-capped Chickadee	8			
Rose-breasted Grosbeak	8			
Great Crested Flycatcher	7			
Red-bellied Woodpecker	7			
Blackburnian Warbler	5			
Eastern Wood-Pewee	5			
Ovenbird	5			
Turkey Vulture	5			
Baltimore Oriole	4			
Eastern Phoebe	4			
Northern Cardinal	4			
Song Sparrow	4			
Tennessee Warbler	4			
White-crowned Sparrow	4			
American Crow	3			
Black-throated Blue Warbler	3			
Gray Catbird	3			
Indigo Bunting	3			
Brown-headed Cowbird	2			
Canada Warbler	2	SC	THR	
Downy Woodpecker	2			
Hairy Woodpecker	2			
Killdeer	2			
Nashville Warbler	2			
Northern Flicker	2			
Red-eyed Vireo	2			
Winter Wren	2			
Wood Thrush	2			
Yellow Warbler	2			
Belted Kingfisher	1			
Black-throated Green Warbler	1			
Chipping Sparrow	1			
Cooper's Hawk	1			
House Wren	1			
Pileated Woodpecker	1			
Red-tailed Hawk	1			
Tree Swallow	1			
Warbling Vireo	1			
White-winged Crossbill	1			
Wilson's Warbler	1			
Total: 44 species	171	Birds		

Appendix K

Winter Raptor Results

Appendix K
Short-eared Owl Survey Results

Species	Short-eared Owl	Total	Total Kilometers	Density / kilometer
November 17, 2011	0	0	103	0.0
November 28, 2012	0	0	99	0.0
November 29, 2011	0	0	94	0.0
December 12, 2011	0	0	117	0.0
December 13, 2011	0	0	91	0.0
January 4, 2012	0	0	123	0.0
January 5, 2012	0	0	115	0.0
January 18, 2012	1	1	107	0.0
January 19, 2012	2	2	59	0.0
February 2, 2012	3	3	118	0.0
February 3, 2012	0	0	79	0.0
February 15, 2012	0	0	106	0.0
February 16, 2012	3	3	70.5	0.0
February 29, 2012	0	0	91	0.0
March 1, 2012	7	7	89	0.1
March 13, 2012	0	0	90	0.0
March 14, 2012	0	0	90.4	0.0

Appendix K
Winter Raptor Driving Survey Results

Species	17-Nov-11	29-Nov-11	13-Dec-11	4-Jan-12	18-Jan-12	19-Jan-12	2-Feb-12	3-Feb-12	15-Feb-12	16-Feb-12	29-Feb-12	1-Mar-12	13-Mar-12	14-Mar-12
Great Horned Owl														
Snowy Owl										1				
Barred Owl														
Short-eared Owl														
Turkey Vulture	79		51	98	3	20			4	4		4	61	28
Osprey														
Bald Eagle	1			3	1								1	
Northern Harrier	13		9	5			1		1	1	1		2	
Sharp-shinned Hawk		2	3	1			1						1	1
Cooper's Hawk	1	2	1							4		1	1	
Northern Goshawk														
Red-shouldered Hawk													4	1
Broad-winged Hawk														
Red-tailed Hawk	57	23	94	69	44	12	70	7	16	80	47	7	98	23
Rough-legged Hawk			3	2			1		1	10			1	
Golden Eagle									1					
American Kestrel	7	3	17	13	8	2	14	2	3	20	7	1	9	1
Merlin														
Peregrine Falcon														
unidentified													4	
Total Raptors	158	30	178	191	56	34	87	9	26	120	55	13	182	54
Km Driven	260	440	381.5	394	276	223.5	440	29	130	338	364	69	311	81
Total Raptors/km	0.6	0.1	0.5	0.5	0.2	0.2	0.2	0.3	0.2	0.4	0.2	0.2	0.6	0.7

Appendix K
Winter Raptor Survey Results

Feature #	Date	Species	Number	Height (m)	Direction	Habitat	Behaviour
wr1	November 17, 2011	RTHA	1			Over woodland/Agricultural field	Hunting
	November 28, 2011	No Observations					
	December 12, 2011	RTHA	1	8		Edge of alfalfa field	Perched then flew to woodlot
	January 5, 2012	No Observations					
	January 19, 2012	No Observations					
	February 3, 2012	No Observations					
	February 15, 2012	Not surveyed due to high snow depth					
	March 1, 2012	SEOW	5	0 to 50		Alfalfa	Roosting, flushed up
	March 14, 2012	No Observations					
wr2	November 17, 2011	NOHA	1			Fallow/Ag swale	Hunting
	November 17, 2011	NOHA	1			Woodlot/Alfalfa	Soaring/hunting
	November 28, 2011	NOSH	1			Hedgerow at edge of Alfalfa field	Perched
	November 28, 2011	RTHA	1		SE	Hedgerow at edge of Alfalfa field	Perched then flew
	December 12, 2011	SEOW	4	0		Alfalfa field	Roosting; flushed as walked by
	December 12, 2011	GHOW	1			Group of white pine on edge of alfalfa field	Flushed from pine as approached
	January 5, 2012	No Observations					
	January 19, 2012	No Observations					
	February 3, 2012	NOHA	1			Alfalfa field	Roosting
	February 15, 2012	Not surveyed due to high snow depth					
	March 1, 2012	No Observations					
	March 14, 2012	No Observations					

Appendix K
Winter Raptor Survey Results

Feature #	Date	Species	Number	Height (m)	Direction	Habitat	Behaviour
wr3	November 28, 2011	NOHA	1		W	Alfalfa	Took off from ground and flew
	November 28, 2011	NOSH	1			Hedgerow bordering alfalfa	Perched
	December 12, 2011	NOHA	1	2		Alfalfa field	Hunting
	December 12, 2011	RLHA	1	8		Edge of alfalfa field	Perched in tree
	December 12, 2011	RTHA	1	5		Alfalfa field	fFlying across field
	5-Jan-12	No Observations					
	19-Jan-12	NOHA	1	10 to 20	E	Field	Flying over field, direct flight
	19-Jan-12	SEOW	1	0 to 20		Fallow field	Roosting, flushed up and flew across road
	3-Feb-12	No Observations					
	15-Feb-12	Not surveyed due to high snow depth					
	1-Mar-12	GOEA	1	100	NE	Over field	Flying
	1-Mar-12	RTHA	1	10			On nest
	14-Mar-12	No Observations					
wr4	November 17, 2011	American Kestrel	1	7		Harvested Hayfield	Perched
	November 17, 2011	Red-tail Hawk	2			Fallow field	Hunting
	November 17, 2011	Turkey Vulture	3			Fallow field	Circling
	November 28, 2011	Red-tail Hawk	1			Fence/hedgerow	Perched
	December 12, 2011	Red-tail Hawk	1	7		Fencerow	Perched
	January 5, 2012	Red-tail Hawk	1			Woodlot	Perched in tree
	January 5, 2012	Short-eared Owl	1	0		Reed canary grass swale	Roosting
	January 18, 2012	Short-eared Owl	1	0		Hayfield with some reed canary grass	Roosting
	February 3, 2012	No Observations					
	February 15, 2012	Merlin	1	10		Woodland near back of ag. Field	Flying
	February 15, 2012	Northern Harrier	1	5 to 15		Over ag. Field	Flying/hunting, flew across road
	February 15, 2012	Northern Harrier	1	3		Field near back of property	Huntin
	February 15, 2012	Red-tail Hawk	1	10		Over woodland	Flying/calling - territorial?
	February 15, 2012	Red-tail Hawk	1	10		Over woodland	Flying/calling - territorial?
	March 1, 2012	American Kestrel	1	10	N	Ag field	Flying
	March 1, 2012	Red-tail Hawk	1	30	W	Ag field	Flying
	March 1, 2012	Red-tail Hawk	1	15		Edge of woodlot	Perched in tree
	March 14, 2012	Northern Shrike	1			Road edge	Circling
	March 14, 2012	Red-tail Hawk	2	45		Over woodland	Circling
	March 14, 2012	Red-tail Hawk	2	45		Over woodland	Circling
	March 14, 2012	Turkey Vulture	1	30	W	Over ag. field	Flying
	March 14, 2012	Turkey Vulture	3	55	W	Over ag. field	Flying

Appendix K
Winter Raptor Survey Results

Feature #	Date	Species	Number	Height (m)	Direction	Habitat	Behaviour
wr5	November 17, 2011	American Kestrel	1	4		Harvested Hayfield	Perched
	November 17, 2011	Red-tail Hawk	1			Harvested Hayfield	Hunting
	November 28, 2011	American Kestrel	1			Hedgerow	Perched in tree
	November 28, 2011	Red-tail Hawk	1			Hedgerow	Perched in tree
	December 12, 2011	Red-tail Hawk	1	below blade sweep	N	Hedgerow/Ag field	Perched then flew
	December 12, 2011	Red-tail Hawk	1	8		Hedgerow	Perched
	January 5, 2012	Red-tail Hawk	1			Deciduous forest	Perched in tree
	January 18, 2012	Red-tail Hawk	1			Woodlot	Perched
	February 3, 2012	American Kestrel	1			Tilled field	Hunting/flying
	February 3, 2012	Red-tail Hawk	1			Hay field near hedgerow/woodlot	Flying/hunting, flying into woodlot
	February 3, 2012	Red-tail Hawk	1			Over hayfield/woods	Hunting, flying towards woodlot
	February 15, 2012	Sharp-shinned Hawk	1	5		Over Ag. Field	Flying
	March 1, 2012	No Observations					
	March 14, 2012	Red-tail Hawk	2	45		Over woodlot	circling/flying
	March 14, 2012	Turkey Vulture	1	30	SE	Over ag field	Flying
wr6	November 28, 2011	No Observations					
	December 12, 2011	Red-tail Hawk	1	in blade sweep		Ag. Field	Circling
	January 5, 2012	Red-tail Hawk	1		N	Deciduous Woods	Flying
	January 18, 2012	No Observations					
	February 3, 2012	Northern Shrike	1			Edge of field in thicket	Perched
	February 15, 2012	No Observations					
	March 1, 2012	No Observations					
	March 14, 2012	Red-tail Hawk	1	15		Over ag. Field	Flying to perch in tree
	March 14, 2012	Northern Harrier	1	10		Over ag. Field	flying
wr7	November 28, 2011	No Observations					
	December 12, 2011	American Kestrel	1	7		Fencerow/Ag field	Perched
	January 5, 2012	Red-tail Hawk	1			Field Edge	Perched in tree
	January 18, 2012	No Observations					
	February 3, 2012	Not Surveyed due to unknown dogs on property					
	February 15, 2012	No Observations					
	March 1, 2012	American Kestrel	1	15		Pasture	Hunting
	March 1, 2012	Red-tail Hawk	1	10		Over Ag, flew to tree	Perched
	March 1, 2012	Turkey Vulture	1	40	W	Over Woodlot	Flying
	March 14, 2012	Red-tail Hawk	1	30		Edge of woods/ ag. Field	Circling
	March 14, 2012	Red-tail Hawk	1	30		Edge of woods/ ag. Field	Circling
	March 14, 2012	Turkey Vulture	1	140		Over Ag. Field	Soaring