Environment

NextEra Energy Canada, ULC
Goshen Wind Energy Centre

Natural Heritage Assessment and Environmental Impact Study Report

draft for discussion

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Glossary of Terms

ANSI	Area of Natural and Scientific Interest
Area of Investigation	Area encompassed by 120 m setback from Project Location boundary.
Candidate Significant Wildlife Habitat	Potential area of wildlife habitat that may be considered significant using procedures established or accepted by MNR.
Confirmed Significant Wildlife Habitat	Area of significant wildlife habitat verified using procedures established or accepted by MNR.
EIS	Environmental Impact Study
ELC	Ecological Land Classification; refers to ecological units defined on the basis of bedrock, climate (temperature, precipitation), physiography (soils, slope, aspect) and corresponding vegetation.
ESA	Environmental Sensitive Area
Frac-out	Escape of drilling mud into the environment as a result of a spill, tunnel collapse or the rupture of mud to the surface.
Generalized Candidate Significant Wildlife Habitat	Wildlife habitats listed in Appendix D of the Natural Heritage Assessment Guide (MNR, 2011) which are not required to be identified for a particular project component, but may exist within 120 m of that component and are assumed to exist.
Laydown Area	A site for temporary storage of construction material.
MNR	Ministry of Natural Resources
Natural Feature	One of the following: (1) an Area of Natural and Scientific Interest (earth science or life science), (2) a coastal wetland, (3) a northern wetland, (4) a southern wetland, (5) a valleyland, (6) a wildlife habitat, or (7) a woodland.
NHIC	Natural Heritage Information Centre
NRVIS	Natural Resources and Values Information System
O. Reg. 359/09	Ontario Regulation 359/09
Project Location	The area encompassing all construction activities and project components.
Project Study Area	Wind Energy Centre Study Area and Transmission Line Study Area
Provincially Significant	Natural feature that the Ministry of Natural Resources has identified as Provincially Significant or that is considered to be Provincially Significant when evaluated using evaluation criteria or procedures established or accepted by the Ministry of Natural Resources.
REA	Renewable Energy Approval
SAR	Provincially and/or Federally-designated Species At Risk

Significant	Natural feature that (1) the Ministry of Natural Resources has identified as significant, or (2) has been confirmed in writing by the Ministry of Natural Resources to have been determined to be significant using applicable evaluation criteria or procedures established or accepted by the Ministry of Natural Resources.
UTM	Universal Transverse Mercator is a geographic coordinate system used to identify locations on the surface of the earth. UTM coordinates are typically recorded with a hand-held Geographic Positioning System (GPS) device.
Valleyland	Natural area that is south and east of the Canadian Shield and occurs in a valley or other landform depression that has water flowing through or standing for some period of the year.
Wetland	Land such as a swamp, marsh, bog or fen, other than land that is being used for agricultural purposes and no longer exhibits wetland characteristics, that (a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface, and (b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants.
Wildlife Habitat	Area where plants, animals and other organisms live or have the potential to live and find adequate amounts of food, water, shelter and space to sustain their population, including an area where a species concentrates at a vulnerable point in its annual or life cycle and an area that is important to a migratory or non-migratory species.
Woodland	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.

1. Introduction

Goshen Wind Inc., a wholly owned subsidiary of NextEra Energy Canada, ULC (NextEra) is proposing to construct a wind energy project in the Municipalities of Bluewater and South Huron, Huron County, Ontario. The Project will be referred to as the Goshen Wind Energy Centre (the "Project") in the vicinity of the shoreline of Lake Huron (see Figure 1.1). The wind turbine technology proposed for the Project is the GE 1.6-100 Wind Turbine with Low-Noise Trailing Edges (LNTE) and the GE 1.56-100 Wind Turbine. The Project is categorized as a Class 4 facility.

AECOM Canada Ltd. (AECOM) was retained by NextEra to prepare a Natural Heritage Assessment (NHA) and, if required, an Environmental Impact Study (EIS) for the proposed Project, in accordance with the requirements of the Renewable Energy Approval (REA) process. The REA process combines previous requirements under the *Ontario Environmental Assessment Act* with clear provincial rules and standards in a new regulation, Ontario Regulation 359/09 (O. Reg. 359/09) under the *Environmental Protection Act*. The Regulation became law on September 24, 2009. Amendments to the regulation came into force on January 1, 2011 and July 1, 2012.

Under the REA process, a proponent who proposes to engage in a renewable energy project is required to conduct a Natural Heritage Assessment (NHA), consisting of the following:

- A Records Review (Section 25);
- A Site Investigation (Section 26); and,
- An Evaluation of Significance to determine the significance or provincial significance of natural features identified in the course of the Records Review and site investigation (Section 27).

Through this process, applicants identify natural features near the proposed Project location and determine if prohibitions and setbacks apply (Sections 37 and 38). In instances where the Project is proposed within such a setback, the applicant must prepare an Environmental Impact Study (EIS) Report (Section 38) to identify and assess the potential negative environmental effects that may result from the proposed renewable energy project, identify appropriate mitigation measures and describe how the potential effects will be addressed through the environmental effects monitoring plan and construction plan.

This document is intended to address the NHA and EIS requirements of O. Reg. 359/09 for the Project. It has been prepared for submission to the Ministry of Natural Resources (MNR) pursuant to sections 28 and 38 of that Regulation.

1.1 Project Location and Description

The proposed Project is located in Huron County, within the Municipalities of Bluewater and South Huron. The Project Study Area consists of the areas being studied for the wind farm component (Wind Energy Centre Study Area), as well as for the interconnection route (i.e., the area being studied for transmission lines to connect the Project to the electrical grid) (Transmission Line Study Area) (Figure 1.1). The Wind Energy Centre Study Area is generally bounded by Klondyke Road to the west, Rogerville Road to the north, Parr Line to the east, and Mount Carmel Drive to the south, in the Municipalities of Bluewater and South Huron. The Transmission Line Study Area is located to the east of the Wind Energy Centre Study Area, and is generally bounded by Parr Line to the west, Thames Road to the north, Perth 164 Road to the east, and Park Road to the south, extending into the Municipality of South Huron (Figure 1.2).

The location of the Project Study Area was defined early in the planning process for the proposed wind energy facility, based on the availability of wind resources, approximate area required for the proposed project, and availability of existing infrastructure for connection to the electrical grid. The Project Study Area was used to facilitate information collection and Records Review. The Project is located south of the Canadian Shield, and outside the Greenbelt Plan and Oak Ridges Moraine Plan Area.

The following co-ordinates define the external boundaries of the Project Study Area:

Longitude	Latitude
-81.6753290	43.4155312
-81.3011931	43.3810955
-81.3303330	43.3036317
-81.7743607	43.2379854

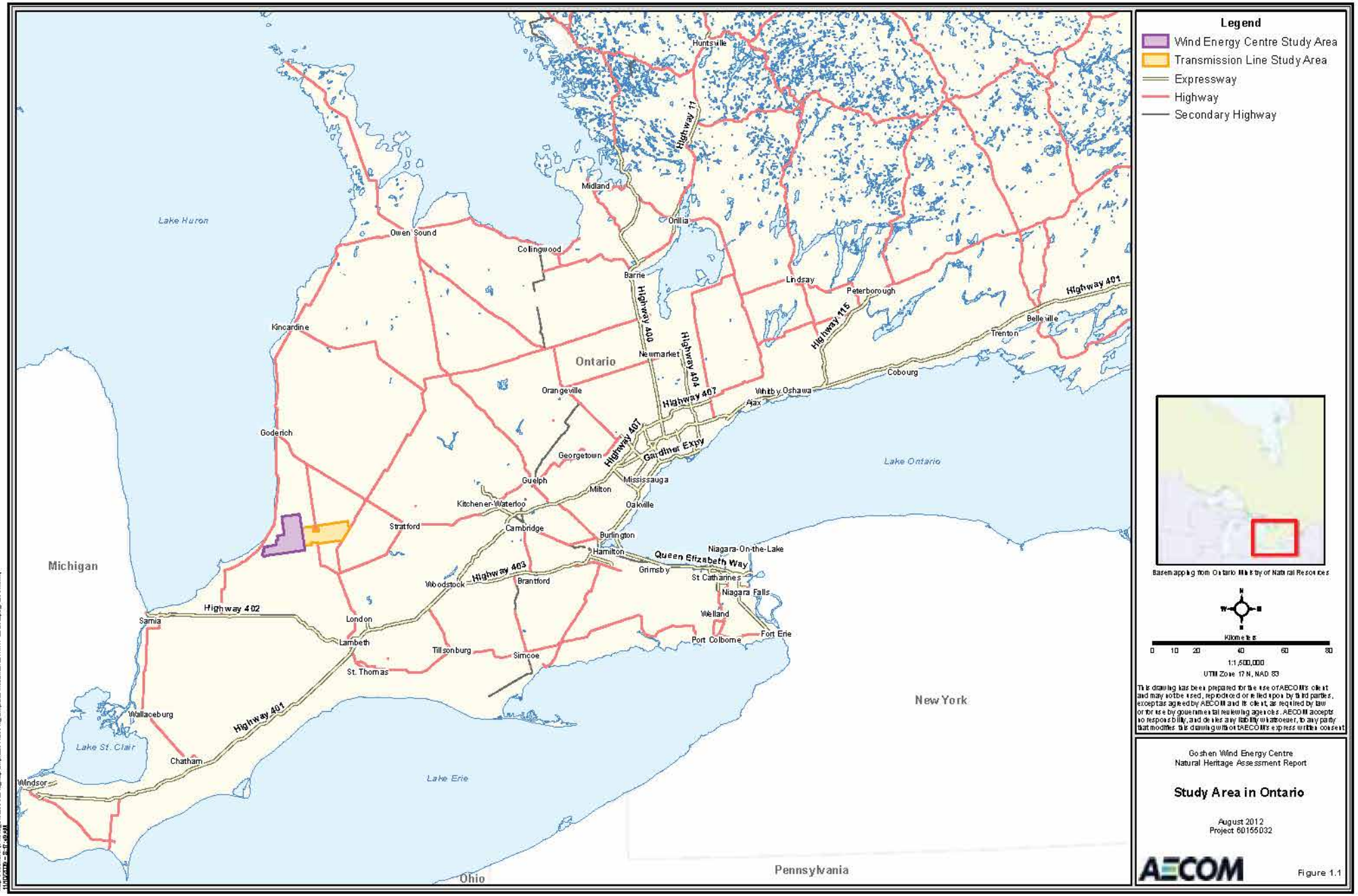
Some overhead electrical lines are expected to be located in a municipal road right-of-way. The electrical substation will be located on privately owned lands with lease arrangements.

A Project Location was identified within the Project Study Area. The Project Location is defined in the Natural Heritage Assessment Guide for Renewable Energy Projects (July, 2011) 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 is engaging in or proposes to engage in the project*". As described therein, the Project Location boundary is the outer limit of where site preparation and construction activities will occur (i.e., Disturbance Areas described below) and where permanent infrastructure will be located, including the air space occupied by turbine blades. The proposed Project Location is shown on Figure 1.2, and includes the locations of the components of the Project listed below.

- Up to 72 GE 1.6-100 Wind Turbine with LNTE and GE 1.56-100 Wind Turbine generator locations and pad mounted step-up transformers (however, only 63 turbines will be constructed);
- Laydown and storage areas (including temporary staging areas, crane pads and turnaround areas surrounding each wind turbine);
- Approximately 113 km of 34.5 kV underground electrical collection lines to connect the turbines to the proposed transformer substation;
- Approximately 24 km of 115 kV transmission line to run from the proposed transformer substation to a breaker switch station which will connect the electricity generated by the project to the existing Hydro One 115 kV transmission line;
- Approximately 68 km of turbine access roads;
- Three permanent meteorological towers; and,
- An operations and maintenance building.

Disturbance Areas have been identified surrounding various Project components, and are depicted on Figure 1.2. These denote areas where temporary disturbance during the construction phase may occur as a result of: temporary project component laydown and storage areas, crane pad construction and turbine turnaround areas. These disturbance areas form part of the Project Location as defined above. With the exception of the project components described above, no permanent infrastructure is proposed within these areas. Following construction activities, the Disturbance Areas will be returned to pre-construction conditions, with the exception of the area wherein vegetation removal will be maintained during operation of the transmission line.

For the purposes of completing the Natural Heritage Assessment, a 120 m Area of Investigation was defined, based on the requirements of O. Reg. 359/09 and the *Natural Heritage Assessment Guide for Renewable Energy Projects* (MNR, July 2011). The Area of Investigation encompasses the Project Location and an additional 120 m surrounding the Project Location, measured from the Project Location boundary as described above. As part of the REA process, features located within the 120 m Area of Investigation must be investigated and evaluated to determine whether they are significant or provincially significant, in order to ascertain whether development prohibitions apply as per O. Reg. 359/09. The location of the 120 m Area of Investigation is shown on Figure 1.2.


Legend
Wind Energy Centre Study Area
Transmission Line Study Area
Expressway
Highway
Secondary Highway
Huntsville
Midland
Orillia
Lake Huron
Owen Sound
Collingwood
Barrie
Lindsay
Peterborough
Belleville
Trenton
Cobourg
Kincardine
Ontario
Newmarket
Orangeville
Whitby
Oshawa
Ajax
Goderich
Georgetown
Mississauga
Lake Ontario
Guelph
Milton
Kitchener-Waterloo
Oakville
Stratford
Cambridge
Burlington
Hamilton
Niagara-On-the-Lake
Michigan
Grimsby
St Catharines
Woodstock
Brantford
Niagara Falls
Welland
Sarnia
London
Port Colborne
Fort Erie
Lambeth
Tillsonburg
Simcoe
St. Thomas
New York
Wallaceburg
Lake St. Clair
Chatham
Windsor
Lake Erie
Ohio
Pennsylvania
Highway 11
Highway 400
Highway 404
Highway 407
Highway 115
Highway 401
Highway 403
Highway 402
Gardiner Expy
Queen Elizabeth Way
Basemapping from Ontario Ministry of Natural Resources
Kilometers
0 10 20 40 60 80
1:1,500,000
UTM Zone 17 N, NAD 83
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Goshen Wind Energy Centre
Natural Heritage Assessment Report
Study Area in Ontario
August 2012
Project 60155032
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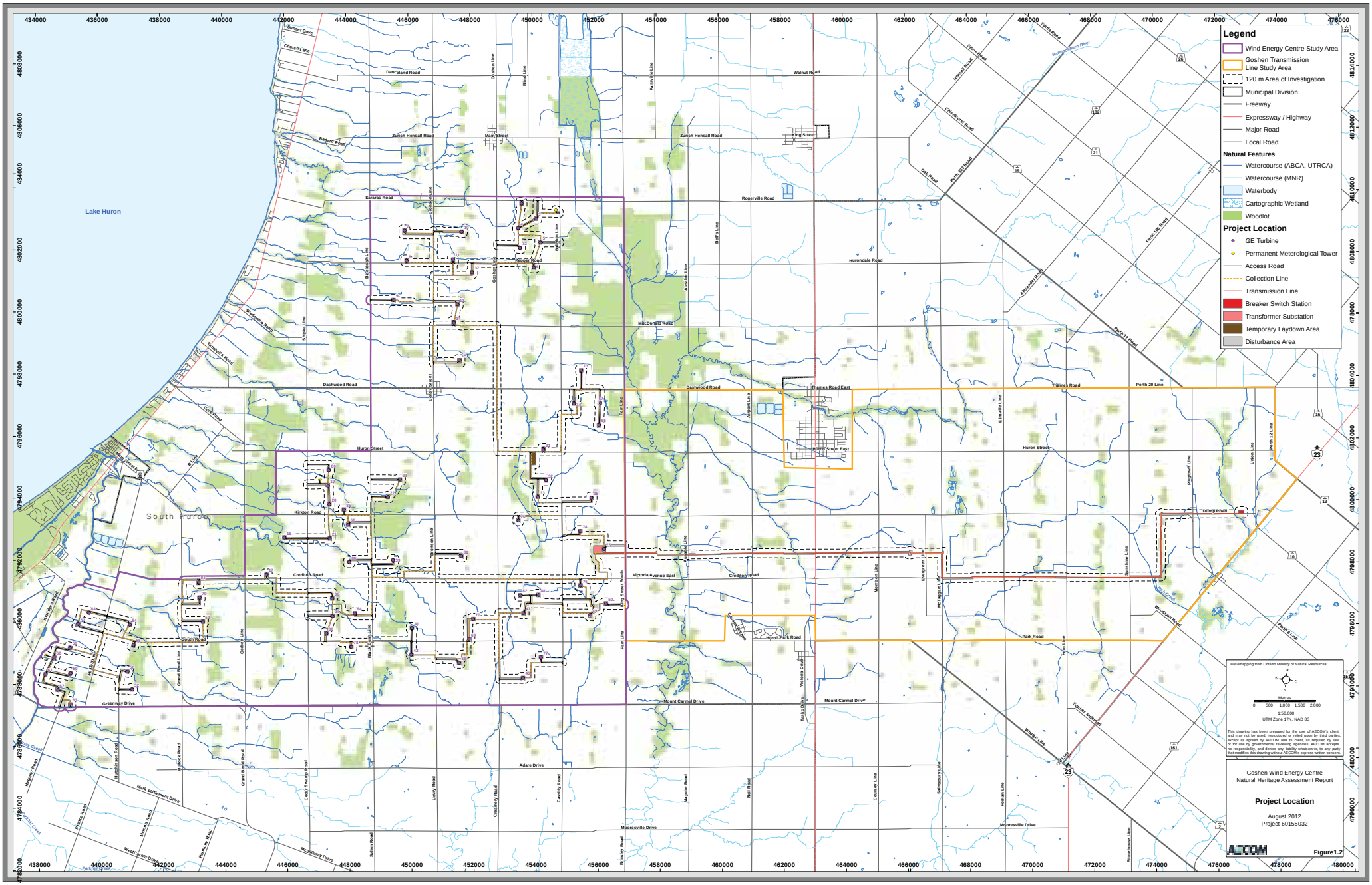
Figure 1.1


Legend
Wind Energy Centre Study Area
Goshen Transmission Line Study Area
120 m Area of Investigation
Municipal Division
Freeway
Expressway / Highway
Major Road
Local Road
Natural Features
Watercourse (ABCA, UTRCA)
Watercourse (MNR)
Waterbody
Cartographic Wetland
Woodlot
Project Location
GE Turbine
Permanent Meterological Tower
Access Road
Collection Line
Transmission Line
Breaker Switch Station
Transformer Substation
Temporary Laydown Area
Disturbance Area
Lake Huron
South Huron
Basemapping from Ontario Ministry of Natural Resources
Metres
0 500 1,000 1,500 2,000
1:50,000
UTM Zone 17N, NAD 83
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Goshen Wind Energy Centre
Natural Heritage Assessment Report
Project Location
August 2012
Project 60155032
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Figure1.2

2. Records Review

2.1 REA Requirements and Methods

Under Section 25 (Natural Heritage, Records Review) of O. Reg. 359/09, a Records Review is required to identify any natural features associated with a renewable energy project. Table 2.1 below outlines the requirements of the Natural Heritage Records Review.

Table 2.1 Natural Heritage Records to be Reviewed

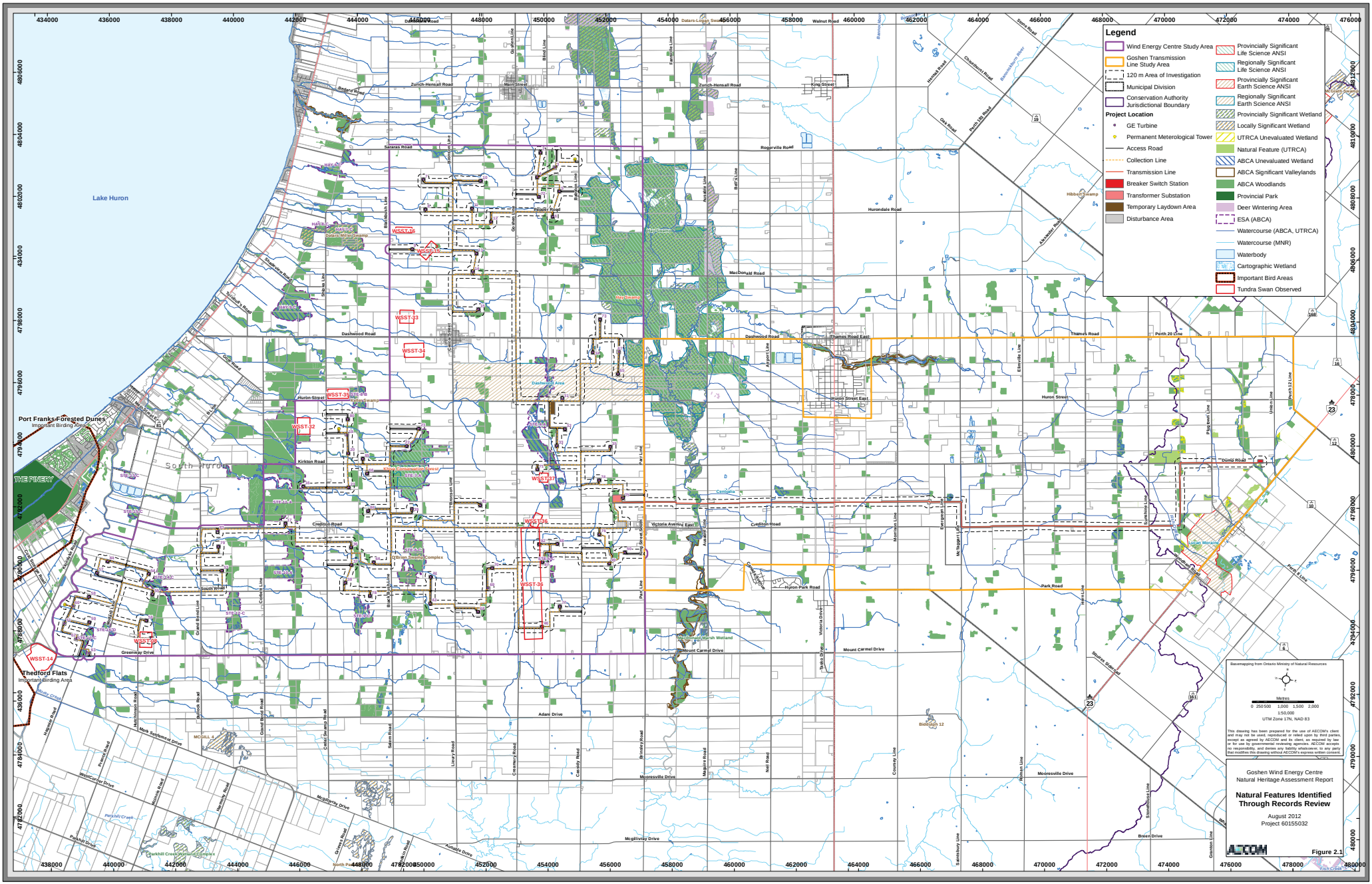
Item	Records to Be searched and Analyzed	Determination to be Made
1.	Records related to provincial parks and conservation reserves and those that are maintained by the Ministry of Natural Resources.	Whether the project location is in a provincial park or conservation reserve or within 120 metres of a provincial park or conservation reserve.
2.	Records that relate to natural features and that are maintained by: i. The Ministry of Natural Resources, ii. The Crown in right of Canada, iii. A Conservation Authority, if the project location is in the area of jurisdiction of the Conservation Authority, iv. Each local and upper-tier municipality in which the project location is situated, v. The planning board of an area of jurisdiction of a planning board in which the project location is situated, vi. The municipal planning authority of an area of jurisdiction of a municipal planning authority in which the project location is situated, vii. The local roads board of a local roads area in which the project location is situated, viii. The Local Services Board of a board area in which the project location is situated, and, ix. The Niagara Escarpment Commission, if the project location is in the area of the Niagara Escarpment Plan.	Whether the project location is: i. In a natural feature, ii. Within 50 metres of an Earth Science Area of Natural and Scientific Interest, or, iii. Within 120 m of any other natural feature protected by the REA Regulation.

The Records Review was conducted for the entire Project Study Area, including the Wind Energy Centre Study Area and the Transmission Line Study Area. An Area of Investigation was also identified, which encompasses the Project Location and an additional 120 m surrounding the Project Location (Figure 1.2). Where possible or applicable, the Records Review of natural features is summarized in the context of the Project Location design and the associated 120 m Area of Investigation (Figure 2.1).

The following types of natural features were reviewed and analyzed in the records Review process:

- Provincial Parks and Conservation Reserves;
- Wetlands;
- Woodlands;
- Valleylands;
- Rare species and significant wildlife habitats; and
- Areas of Natural and Scientific Interest (ANSIs).

An assessment of Endangered and Threatened species (Species at Risk) and their habitats protected under the *Endangered Species Act* (ESA) has been undertaken separately and will be addressed through a separate consultation and permitting process, if required, with the Ministry of Natural Resources (MNR) Guelph District. As such, records related to known occurrences of Species At Risk obtained through the records review process are not presented here.


Legend
Wind Energy Centre Study Area
Goshen Transmission Line Study Area
120 m Area of Investigation
Municipal Division
Conservation Authority Jurisdictional Boundary
Project Location
GE Turbine
Permanent Meterological Tower
Access Road
Collection Line
Transmission Line
Breaker Switch Station
Transformer Substation
Temporary Laydown Area
Disturbance Area
Provincially Significant Life Science ANSI
Regionally Significant Life Science ANSI
Provincially Significant Earth Science ANSI
Regionally Significant Earth Science ANSI
Provincially Significant Wetland
Locally Significant Wetland
UTRCA Unevaluated Wetland
Natural Feature (UTRCA)
ABCA Unevaluated Wetland
ABCA Significant Valleylands
ABCA Woodlands
Provincial Park
Deer Wintering Area
ESA (ABCA)
Watercourse (ABCA, UTRCA)
Watercourse (MNR)
Waterbody
Cartographic Wetland
Important Bird Areas
Tundra Swan Observed
Lake Huron
Port Franks Forested Dunes
Important Birding Area
Thedford Flats
Important Birding Area
THE PINERY
South Huron
Basemapping from Ontario Ministry of Natural Resources
Metres
0 250 500 1,000 1,500 2,000
1:50,000
UTM Zone 17N, NAD 83
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Goshen Wind Energy Centre
Natural Heritage Assessment Report
Natural Features Identified Through Records Review
August 2012
Project 60155032
AECOM
Figure 2.1

2.1.1 Background Information Sources

The records reviewed for the Project Study Area included a review of the following key resources (date of information that was searched or collected is shown in brackets):

- The Huron County Official Plan (1998);
- The Municipality of Bluewater Official Plan (2005);
- The Municipality of South Huron Official Plan (2012);
- Natural Heritage Information Centre (NHIC) (MNR, 2011a);
- Ministry of Natural Resources (MNR) Natural Resources and Values Information System (NRVIS) mapping (2011b);
- Land Information Ontario (LIO) data layers (MNR, 2010) for:
  - Nesting Sites;
  - Thermal Assessment of Watercourses;
  - Water Virtual Flow;
  - Staging Area Wildlife;
  - Nursery Area Wildlife;
  - Deer Wintering Areas;
  - Conservation Reserves;
  - Ontario Hydro Network Waterbody;
  - Ontario Hydro Network Watercourse;
  - Provincial Park Regulated;
  - National Wildlife Area;
  - Crown Game Preserves;
  - Areas of Natural and Scientific Interest (ANSIs);
  - Environmentally Significant Areas (ESAs);
  - Evaluated Wetlands;
  - Fish Spawning areas; and
  - Wooded Areas.
- MNR Wetland Evaluations (various);
- MNR ANSI Reports (various);
- Ausable Bayfield Conservation Authority (ABCA) GIS data layers and published reports (various);
- Upper Thames River Conservation Authority (UTRCA) GIS data layers and published reports (various);
- Ontario Provincial Parks website (2011c);
- Land Use Policy Atlas (2011);
- Important Bird Areas database (IBA, 2011); and
- Various wildlife atlases (birds, mammals, herpetofauna).

2.1.2 Agency Correspondence

Written requests for natural heritage information were made to a number of agencies. These requests were made for available information pertaining to natural features (Provincial Parks and Conservation Reserves, wetlands, woodlands, valleylands, wildlife habitat and ANSIs), species inventories and related GIS data layers. Table 2.2 describes the agencies contacted, information source, and data or information obtained.

2.1.3 Preliminary Avian Surveys

An initial series of avian surveys was conducted by Golder Associates for the Wind Energy Centre Study Area. The Goshen Wind Energy Centre Avian Use Monitoring Report – 2010 (Golder Associates, 2011), which is located in Appendix A, describes the results of spring Tundra Swan/waterfowl surveys, winter avian use surveys, spring migration avian use surveys, breeding (summer) avian use surveys and fall migration avian use surveys. It was used in conjunction with Ontario Breeding Bird Atlas (Cadman *et al*. 2007) data to describe the bird species known to use habitats in the Project Study Area.

Table 2.2 Summary of Agency Consultation

Agency	Information Source/Method of Consultation	Data or Information Obtained
Ministry of Natural Resources	• June 8, 2010: AECOM submitted NHA work plan and Records Review request to MNR Guelph District. • August 25, 2011: AECOM resubmitted NHA Records Review request, as requested by MNR Renewable Energy Operations Team. • March 21, 2012: AECOM submitted NHA Records Review request for the Transmission Line Study Area.	• August 31, 2010: MNR Guelph District provided information pertaining to wetlands, woodlands, ANSIs, and wildlife habitat within the Wind Energy Centre Study Area. • September 20, 2011: MNR Renewable Energy Operations Team provided information pertaining to wetlands, woodlands, valleylands, ANSIs, and significant wildlife habitat within the Wind Energy Centre Study Area. • May 1, 2012: MNR Renewable Energy Operations Team provided information pertaining to wetlands, woodlands, valleylands, ANSIs, and significant wildlife habitat within the Transmission Line Study Area. • May 27, 2012: MNR Guelph District provided information pertaining to the wetland evaluation for McDonald Marsh.
Ausable Bayfield Conservation Authority (ABCA)	• August 12, 2010: AECOM requested natural heritage information relevant to the Project Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers. • September 8, 2011: AECOM requested rare species information for the Project Study Area. • November 22, 2011: AECOM requested the GIS layer for conservation areas owned by ABCA as well as the percentage of wooded areas in the Goshen Study Area. AECOM also requested information regarding conservation areas and ESAs in the Goshen Study Area. • November 24, 2011: AECOM requested information pertaining to ABCA conservation areas and ESAs in the Project Study Area, including any relevant reports, species inventories, and information on wildlife habitats and/or ecological functions of the areas. • March 12, 2012: AECOM requested natural heritage information relevant to the Transmission Line Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers.	• May 24, 2011: ABCA provided GIS data layer for natural areas mapping. • September 14, 2011: In regard to the request for information on rare species, ABCA suggests retrieving information from NHIC. • November 17, 2011: ABCA confirmed that they do not have a significant woodlands GIS data layer, and that the Natural Areas data layer provided by ABCA includes all woodlands, wetlands, thickets, meadows, valleylands, etc. • November 29, 2011: ABCA provided a copy of the report describing ESAs in the Project Study Area (ABCA, 1984). • December 19, 2011: ABCA provided GIS layers for conservation areas in the Wind Energy Centre Study Area. • March 26, 2012: ABCA provided GIS layers for natural features including woodlands, significant valleylands and wetlands, as well as ABCA owned conservation lands.
Upper Thames River Conservation Authority (UTRCA)	• March 13, 2012: AECOM requested natural heritage information relevant to the Transmission Line Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers.	• March 16, 2012: UTRCA provided comments and GIS data layers for natural areas and unevaluated wetlands.
Canadian Wildlife Service (CWS)	• May 12, 2011: AECOM requested natural heritage information relevant to the Project Study Area, including species inventories and information pertaining to wildlife habitat.	• June 10, 2011: CWS recommended consulting with the MNR district office, MNR's NHIC database, and the Ontario Breeding Bird Atlas.
Huron County	• May 12, 2011: AECOM requested natural heritage information relevant to the Project Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers. • March 12, 2012: AECOM requested natural heritage information relevant to the Transmission Line Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers.	• May 12 and 20, 2011: Huron County indicated that natural heritage information they have was obtained from the Ausable Bayfield Conservation Authority or MNR. Due to license restrictions on sharing agreements, this information should be requested directly from those agencies. • November 17, 2011: Huron County indicated that the Bluewater Official Plan (OP) identifies that forests cover approximately 16.5% of lands within the Municipality (Section 6.1) and that Section 6.4.6 of the OP states that forested areas greater than 1 ha and less than 4 ha are of local significance while forested areas 4 ha and larger are

Table 2.2 Summary of Agency Consultation

Agency	Information Source/Method of Consultation	Data or Information Obtained
		of Provincial significance. The determination of the boundaries of the forested areas and their classification would have been completed in consultation with the Ausable Bayfield Conservation Authority (ABCA). ABCA should be contacted for the latest forested area mapping. • March 23, 2012: Huron County advised that it would be best to obtain natural heritage information from the local conservation authority.
Municipality of Bluewater	• May 12, 2011: AECOM requested natural heritage information relevant to the Project Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers. • September 12, 2011: AECOM requested information pertaining to the percentage of wooded areas in the Municipality of Bluewater, criteria used to evaluate significant woodlands and related GIS data layers for significant woodlands, as identified in the Municipality of Bluewater Official Plan. • September 29 and November 17, 2011: AECOM requested information pertaining to the percentage of wooded areas in the Municipality of Bluewater. • March 12, 2012: AECOM requested natural heritage information relevant to the updated Project Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers.	• September 19, 2011: Municipality of Bluewater indicated that they forwarded AECOM's request to ABCA and other agencies (including Huron County) to determine who has the most information that would be of value to AECOM. When the Municipality of Bluewater receives advice as to who/which agency will be handling this request, the Municipality of Bluewater will forward that information to AECOM. • September 19, 2011: Municipality of Bluewater forwarded request for information pertaining to significant woodlands and related GIS data layers to Huron County. • April 24, 2012: Municipality of Bluewater indicated for AECOM to refer to the MNR, Ausable Bayfield Conservation Authority and relevant agencies to develop information relating to the natural features within the Goshen Transmission Line Study Area.
Municipality of South Huron	• May 12, 2011: AECOM requested natural heritage information relevant to the Project Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers. • September 12, 2011: AECOM requested information pertaining to the percentage of wooded areas in the Municipality of South Huron, criteria used to evaluate significant woodlands and related GIS data layers for significant woodlands, as identified in the Municipality of South Huron Official Plan. • September 29, 2011: AECOM requested information pertaining to the percentage of wooded areas in the Municipality of South Huron. • March 12, 2012: AECOM requested natural heritage information relevant to the updated Project Study Area, including information pertaining to woodlands, valleylands, wetlands, wildlife habitat, species inventories, conservation areas and related GIS data layers.	• September 12, 2011: Municipality of South Huron indicated AECOM should contact the Ausable Bayfield Conservation Authority for mapping. • October 5, 2011: Municipality of South Huron forwarded request for percentage of wooded areas to Huron County. On October 5, 2011, Huron County indicated that ABCA would have the most up-to-date information. • March 13, 2012: Municipality of South Huron responded that AECOM should contact Huron County and ABCA for information.

AECOM conducted additional breeding bird surveys in 2011 to identify bird breeding habitats associated with specific natural areas located within the 120 m Area of Investigation. Breeding bird surveys were conducted from late May 2011 to early July 2011 for features located at or within 120 m of turbine locations in a preliminary project layout for which property access was obtained at the time of the surveys. The 2011 breeding bird survey protocol was developed with reference to the Birds and Bird Habitats Guidelines for Wind Power Projects (MNR, 2010a).

Field maps showing the extent of the areas searched in each survey are provided in Appendix B. These surveys were undertaken by qualified biologists (qualifications of field personnel are provided in Appendix C). Two surveys were

conducted at least ten days apart at each location, as permitted by property access. Surveys were conducted in the morning between sunrise and 11:00 am. During each survey, an area search (as defined in MNR, 2010a and described below) was conducted within the area of the feature located at or within 120 m of a proposed turbine (*i.e.,* within a circular area having a radius of 171.5 m; or 120 m from turbine blade tip). Surveyors recorded the locations of all bird species encountered (seen or heard), as well as the date, start time, finish time, and weather conditions during the survey. A complete list of species detected on each visit was compiled and evidence of breeding and observations of other relevant behaviours was recorded using standard breeding bird atlas codes (EC-CWS, 2007c). A complete list of bird species observed during 2011 breeding bird surveys conducted by AECOM is provided in Appendix B.

Additional breeding bird surveys were conducted in 2012 for specific natural features identified as candidate significant wildlife habitat for birds through the site investigation. The survey methods and results of 2012 breeding bird surveys are presented in the evaluation of significant chapter (Section 3.0) of this report.

2.1.3.1 Tundra Swan

A preliminary spring Tundra Swan/waterfowl survey was conducted in March 2010 as described in the Goshen Wind Energy Centre Avian Use Monitoring Report (Appendix A). All roads within the Avian Study Area were driven, with frequent stops made to survey fields and other habitats for birds. In addition, the shore of Lake Huron on the westernmost edge of the Avian Study Area was surveyed. Fields and Lake Huron were scanned using a high power spotting scope and good quality binoculars. All birds identified were recorded.

Additional spring Tundra Swan migration surveys were completed by AECOM in 2012. These surveys were conducted on three occasions approximately one week apart during the peak Tundra Swan migratory period in March 2012. All roads within the Goshen Wind Energy Study Area were driven, with frequent stops made to visually search fields and other habitats for Tundra Swans. To the extent possible, surveys were conducted under calm, clear weather conditions. Weather conditions (wind, cloud cover, temperature), start time and end time were recorded on all survey dates. Surveys were conducted between sunrise and noon, during the most active period for the Tundra Swans. During the surveys, all waterfowl observed via binoculars and spotting scopes were recorded (i.e., at their approximate GPS point or by recording the location on a map so as to minimize disturbance), identified, and their age (adult or immature), and behaviour noted. Field notes are provided in Appendix B.

The results of these surveys conducted in 2010 and 2012 were used in combination with Tundra Swan observations reported by local residents to identify locations of possible Waterfowl Stopover and Staging Areas (a type of significant wildlife habitat). These locations were further investigated during the site investigation phase of this Natural Heritage Assessment.

2.2 Results of the Records Review

Available background data were reviewed to determine which portions of the Project Location are in a natural feature or within 120 m of a natural feature (50 m of Earth Science ANSIs). The results of the Records Review are described in the following sections and shown on Figure 2.1.

2.2.1 Records Related to Provincial Parks and Conservation Reserves

2.2.1.1 Provincial Parks

Based on the Provincial Parks and Conservation Reserves layers maintained by Land Information Ontario, as well as the Crown Land Use Policy Atlas administered by the Ministry of Natural Resources, there are no provincial parks

identified within the Project Study Area. The closest provincial park to the study area is Pinery Provincial Park, located approximately 1.3 km from the southwest corner of the Project Study Area and 2.1 km from the Project Location. A search of the Ontario Provincial Parks website (accessed on May 10, 2011) was also undertaken, through which no provincial parks were identified within the Project Study Area. As a result, no additional work for this feature type is required in subsequent phases of the NHA for the Project.

2.2.1.2 Conservation Reserves

There are no Conservation Reserves within the Project Study Area (MNR, 2011d and MNR, 2012). As a result, no additional work for this feature type is required in subsequent phases of the NHA for the Project.

2.2.2 Records Related to Natural Features

2.2.2.1 Wetlands

As described in the MNR's Ontario Wetland Evaluation System Manual (3rd edition; December, 2002), wetlands are lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface, where the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants.

Evaluation and identification of wetlands as Provincially Significant is completed through a standardized assessment process developed by the MNR, the Ontario Wetland Evaluation System (OWES). The key components considered in a wetland evaluation are the biological, social, hydrological and special features of the wetland or wetland complex. Based on scoring, a wetland can fall into one of two classes: Provincially Significant or Locally Significant (non-Provincially significant).

A review of the Natural Heritage Information Centre (MNR, 2011a; accessed on 15 March 2012), MNR Natural Resources and Values Information System (NRVIS) mapping (accessed on 15 March 2012), and the Evaluated Wetlands data layer maintained by Land Information Ontario (MNR, 2010; accessed on 15 March 2012), has indicated that there are two evaluated Provincially Significant Wetlands (Hay Swamp and MacDonald Marsh) and three evaluated Locally Significant Wetlands (Datars-Miller Swamp, Keller Swamp and O'Brien Swamp complex) located within, or immediately adjacent to the Project Study Area. MacDonald Marsh is designated as Locally Significant in records used in this Records Review; however, according to correspondence with MNR (May 7, 2012), this designation has recently been upgraded to Provincially Significant. As a result, MacDonald Marsh is reflected as Provincially Significant in this NHA report

No Provincially Significant coastal wetlands were identified within the Project Study Area, Project Location or 120 m Area of Investigation (MNR, 2011a).

Provincially Significant Wetlands

- Hay Swamp, 268 ha in size, is a Provincially Significant Wetland (PSW) complex, which represents the largest natural feature in the Project Study Area. The following description of this Provincially Significant Wetland is derived from the Natural Heritage Information Centre (NHIC) Natural Area Record (MNR, 2011a). This wetland complex contains fifteen individual wetlands and is composed of two wetland types, including 98% swamp and 2% marsh. Soils are predominantly clay, loam or silt (78%) with some organic content (22%), and the site type is classified as 74% riverine, 24% palustrine and 2% isolated. Hay Swamp provides nesting habitat for colonial waterbirds and is an active feeding area. This Provincially Significant Wetland also provides winter cover for wildlife, is of local significance for Deer, and provides habitat for many different species including bullfrogs,

Snapping Turtles, and a diversity of mammals including Muskrat, Raccoon, Beaver, Mink, Red Fox, Coyote, Striped Skunk, and Squirrels (MNR, 2011a).

Hay Swamp occurs within the Project Study Area, but is located outside of the Area of Investigation. At Babylon Line, north of Pepper Road, Hay Swamp is approximately 250 m from the Project Location (75 m from the 120 m Area of Investigation). In the area south of Dashwood Road and west of Parr Line, Hay Swamp is located approximately 121 m from the Project Location (occurring along the boundary of the Area of Investigation).

- MacDonald Marsh is a wetland complex that has recently been designated as Provincially Significant. This change in designation (from Locally Significant) reflects the status of Snapping Turtle as a Special Concern species, which occurred following the completion of the wetland evaluation. The complex is composed of five individual wetlands. Wetlands within this complex are composed of two wetland types (12% swamp and 88% marsh). The soil type is 100% sand. MacDonald Marsh provides suitable waterfowl breeding habitat, locally significant fish spawning and nursery habitat (MNR, 2011a). MacDonald Marsh occurs outside of the Project Study Area, approximately 2,700 m outside of the Area of Investigation.

While these two Provincially Significant Wetlands occur within, or directly adjacent to the Project Study Area, both are located outside of the 120 m Area of Investigation.

Locally Significant Wetlands

According to MNR's Natural Resource Values Information System (NRVIS) mapping (MNR, 2011b), there are three Locally Significant Wetlands or wetland complexes, covering a total area of approximately 98 ha within the Goshen Project Study Area. The following general descriptions of the locally significant wetlands located within, or immediately adjacent to the study area, are derived from NHIC Natural Area Records (MNR, 2011a).

- Datars-Miller Swamp, 78 ha in size, is a non-Provincially significant coastal wetland complex containing two individual wetlands composed of 100% swamp. The soil type is 100% clays, loams or silts and the site type is classified as 66% palustrine and 34% isolated. The Datars-Miller Swamp provides winter cover for wildlife including White-tailed Deer and Red Fox, squirrels and Raccoon (MNR, 2011a). Datars-Miller Swamp is located approximately 730 m outside of the Area of Investigation.
- Keller Swamp, covering 5 ha, is a Locally Significant Wetland that is 100% swamp. The soil type is 100% clays, loams or silts and the site type is classified as 100% isolated. The Keller Swamp provides habitat to Racoons (MNR, 2011a). Keller Swamp is located approximately 350 m outside of the Area of Investigation.
- O'Brien Swamp complex is a Locally Significant Wetland complex, 15 ha in size containing three individual wetlands composed 100% of swamp. The soil type is 100% clays, loams or silts and the site type is classified as 100% palustrine. The O'Brien Swamp provides winter cover for wildlife including the Ruffed Grouse, Cottontail, Squirrel and Fox. It also provides habitat for Racoons (MNR, 2011a). O'Brien Swamp complex is located approximately 90 m outside of the Area of Investigation.

While these three Locally Significant Wetlands occur within, or directly adjacent to the Project Study Area, all three are located outside of the 120 m Area of Investigation.

Unevaluated Wetlands

Unevaluated wetlands are associated with several Environmentally Significant Areas (ESAs) located within the Project Study Area (ABCA, 1984). In total, twelve ESAs have been identified within the Project Study Area, seven of which are located in the 120 m Area of Investigation (Figure 2.1). All seven of these areas are described as

containing wetlands (STE-17-C, STE-14-C, STE-10-A, STE-11-A, STE-4-A, STE7-A and STE-5-C ABCA, 1984). Detailed descriptions of these ESAs are provided in Section 2.2.1.7 of this report. These features were assessed during site investigations to determine whether they contain wetlands within the 120 m Area of Investigation.

The mapped locations of unevaluated wetlands under the jurisdiction of Ausable Bayfield Conservation Authority (ABCA) were provided by ABCA as part of this Records Review. Unevaluated wetlands, identified by ABCA within the Wind Energy Centre and Transmission Line Study Areas (located in the area approximately west of Sunshine Line) are shown on Figure 2.1. These features were assessed during site investigations to determine whether they contain wetlands within the 120 m Area of Investigation.

The mapped locations of unevaluated wetlands under the jurisdiction of Upper Thames River Conservation Authority (UTRCA) were provided by UTRCA as part of this Records Review. Unevaluated wetlands, identified by UTRCA within the Transmission Line Study Area (located in the area approximately east of Sunshine Line) are shown on Figure 2.1. These features were assessed during site investigations to determine whether they contain wetlands within the 120 m Area of Investigation.

There is potential for additional unevaluated wetlands to exist in the Project Study Area. The presence or absence of wetland features within the 120 m Area of Investigation was determined during site investigations.

2.2.2.2 Woodlands

The Project Study Area is located in the Mixed-wood Plains Forest Region (MNR, 2012a). Under natural conditions, the forest in this region consists of a diverse mix of conifer (such as pine, cedars and hemlock) and deciduous tree species (maples, ashes, oaks, elm, poplars and several other groups).

MNR's NRVIS mapping and natural features mapping provided by ABCA and UTRCA indicate that the Project Study Area contains woodlands ranging in size from small hedgerow features to woodlands approximately 180 ha in size. The Wind Energy Centre Study Area contains a large number of isolated woodlands. Larger, contiguous wooded areas are associated with Hay Swamp (east of Babylon Line) and in the southwestern portion of the Project Study Area, along Corbett Line. Narrow bands of woodland corridors occur throughout the Transmission Line Study Area, predominately running north-south in orientation.

The Official Plan for the Municipality of Bluewater states in Section 6.4 (Natural Environment Policies), that "the most significant natural features in the Municipality, identified as being Provincially or locally significant, are designated Natural Environment" (Official Plan – Schedule B). Within the Municipality of Bluewater, a number of woodlands of varying size and some larger, contiguous woodland areas occurring in the 120 m Area of Investigation are included under this designation in the Official Plan. Woodlands shown in Schedule B of the Official Plan are reflected as ABCA Woodlands on Figure 2.1 of this report.

Section 3.4.2 of the Official Plan for The Municipality of South Huron states that "Significant Woodlands have been determined based on the following criteria: woodland size, proximity to other natural features, woodland shape, proximity to watercourses and potential connectivity/linkage". All wooded areas in excess of 2 ha are considered significant in South Huron. The South Huron Official Plan has designated the most significant and sensitive natural areas. These features are designated "Natural Environment" on Schedule B of the Official Plan. Woodlands shown in Schedule B of the Official Plan are reflected as ABCA Woodlands and UTRCA Natural Features on Figure 2.1 of this report.

Woodlands within the 120 m Area of Investigation were assessed during site investigations.

2.2.2.3 Valleylands

Under the REA regulation, a “valleyland” is defined as a natural area that is south and east of the Canadian Shield and occurs in a valley or other landform depression that contains flowing or standing water for some period of the year (MNR, 2011).

The mapped locations of Significant Valleylands under the jurisdiction of ABCA were provided by ABCA as part of this Records Review. Three Significant Valleylands have been identified by ABCA within or adjacent to the Wind Energy Centre and Transmission Line Study Areas and are shown on Figure 2.1. While all three of these Significant Valleylands are located outside of the 120 m Area of Investigation, one is associated with the Ausable River approximately 720 m south of the proposed transmission line crossing.

A number of tributaries, creeks and rivers occur within the Project Study Area, which may exhibit valleyland characteristics. Watercourse features within the Project Location and its associated 120 m Area of Investigation were assessed during site investigations to determine if valleylands are present or absent.

2.2.2.4 Wildlife Habitat (including rare species)

Wildlife habitat is defined in the Significant Wildlife Habitat Technical Guide (MNR, 2000) as areas where plants, animals and other organisms live and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle, and areas which are important to migratory or non-migratory species.

A review of wildlife habitat was conducted using available secondary source information and the compiled information provided by MNR for the Project Study Area, in order to assess wildlife use and to determine if areas of confirmed Significant Wildlife Habitat occur within the Project Study Area.

The Port Franks Forested Dunes Important Bird Area (IBA) ON024 is located approximately 390 m to the west of the Project Study Area and approximately 1 km from the Project Location. It is located between the shoreline of Lake Huron and Lakeshore Road. Important Bird Areas Canada describes the Port Franks Forest and Wetlands as follows:

> *The Port Franks Dune Forest complex lies along the Lake Huron Shoreline just to the south of Grand Bend in Lambton County. In all, the forest complex covers over 45 km^2 and is the largest forested area on the eastern shore of Lake Huron south of the Bruce Peninsula. The whole site is nearly contiguous forest, and includes important areas such as Pinery Provincial Park, Lambton County Heritage Forest, Port Franks Forested Dunes and Wetlands, Karner Blue Sanctuary, and the Kettle Point Indian Reserve. The forest complex is generally comprised of a series of wooded dunes (oak and pine) that extend inland from the Lake Huron shoreline. The oldest dunes, which are situated farthest inland, are nearly 25 m high. A series of low wet interdunal meadows and ponds lie between the dune ridges. The varied topography and mix of wetland and upland habitats make the forest complex very diverse. The area supports an exceptional concentration of provincially and nationally threatened vegetation communities, flora, and fauna.*
>
> *The Port Franks Forest Complex supports an exceptional concentration of threatened bird species. At least six species identified as threatened in Canada have bred here in recent years, and two additional threatened species have historically bred here. These threatened species include: Hooded Warbler (Nationally Threatened) - ten territories were reported from the Port Franks Forested Dunes and Wetlands section in 1994, and nine territories were recorded from this section*

in 1997. This may represent as much as 6.9% of Canada's estimated Hooded Warbler population; Acadian Flycatcher (Nationally Endangered) - one territory was reported in 1997 - fewer than 50 pairs of this species are estimated in Canada; Red-Headed Woodpecker (Nationally Vulnerable) - 5 to 10 pairs consistently nest within the forest complex (close to 1% of the estimated national population); Cerulean Warbler (Nationally Vulnerable) - at least three singing males were recorded in 1997; Louisiana Waterthrush (National Vulnerable) - one singing male was recorded in 1997; and Red-shouldered Hawk (Nationally Vulnerable) - one pair nested in 1998. Threatened species that formerly nested in the forest complex include: Prothonotary Warbler (Nationally Endangered) - for three years in the mid-1980s one pair bred successfully at Pinery Provincial Park; and Prairie Warblers (Nationally Vulnerable, although recently downlisted May 1999) - as many as 20 pairs were present in the 1970s, 6 pairs were present in the early 1980s, and unfortunately, only one sighting since. In addition to threatened species, the forest complex is significant for forest birds in general, with 15 to possibly 18 species of breeding wood warblers being recorded during surveys completed in 1994 and 1997. Large numbers of warblers and other songbirds also congregate in the forests along the lake shore during both the spring and fall migrations. From a landscape perspective, the forest complex is well situated to act as a 'bottleneck', and invertebrates are likely abundant due to the proximity of the lake and the numerous wetlands. However, numbers of migrants are not well documented (IBA Canada, 2011).

Thedford Flats IBA ON026 occurs along the southwestern corner of the Project Study Area, located west of Lakeshore Road. Important Bird Areas Canada describes the Thedford Flats as follows:

The Thedford Flats are located near the Lake Huron shoreline in northwest Lambton County, about 10 km north of Thedford, and 10 km south of Grand Bend. Pinery Provincial Park borders the west side of the site. At one time this area was a shallow bay and marsh that was cut off from Lake Huron by the formation of 30 metre high dunes on the east side of what is now Pinery Provincial Park. In 1875, a canal was cut through the dunes to drain the marsh, and the last remnant (Lake Smith), was drained circa 1959. At present, the flats must be drained with pumps in the spring. Potatoes and onions have been grown here, but in recent years the crops were primarily corn and beans.

Since at least 1970, Tundra Swans have congregated at the Thedford Flats during late March. Peak one-day counts have been recorded regularly since the early 1980s, and the long-term average (1983 to 1998) is just over 7,600 birds. A more recent average (1993 to 1998) is 10,800 birds, which is almost 6.5% of the North American Tundra Swan population, and about 12.5% of the estimated eastern population. The maximum one-day count was recorded in 1994, when 16,356 birds were tallied. Since these one-day counts consider turnover rates, the number of swans moving through the site during the entire spring migration is likely much larger (IBA Canada, 2011).

The Port Franks Forest and Wetland IBA and the Thedford Flats IBA are located outside the 120 m Area of Investigation. The Port Franks Forest IBA occurs approximately 390 m outside the Project Study Area and 930 m outside the 120 m Area of Investigation; the Thedford Flats IBA is located approximately 1.3 km outside the Project Study Area and 1.6 km outside the 120 m Area of Investigation.

Information provided by the Lambton Heritage Museum indicates that Tundra Swan migration typically occurs between mid to late-March, but can vary significantly based on weather conditions (Table 2.3).

Table 2.3 Tundra Swan Migration Data Obtained from the Lambton Heritage Museum

Year	Date Tundra Swans Arrive	Date Tundra Swans Depart (or end of monitoring)	Maximum Number of Tundra Swans Observed (Daily Observation)
2002	February 22	March 31	17,000
2003	March 17	-	few
2004	March 2	March 25 (end of monitoring)	25,000
2005	March 21	April 4 (end of monitoring)	unknown
2006	March 9	March 28	unknown
2007	March 10	April 3 (end of monitoring)	many
2008	March 20	April 6 (end of monitoring)	20,000
2009	March 14	March 31	10,000
2010	March 10	March 21	>1,000
2011	March 8	April 3 (end of monitoring)	>20,000
2012	December 30, 2011	March 17, 2012	500

Several Environmentally Significant Areas (ESAs) have been designated by ABCA within the Project Study Area. Although these areas are not identified as natural features requiring identification and evaluation within O.Reg. 359/09, a consideration of the ecological features and functions of these areas contributes to an understanding of wildlife habitat across the Project Study Area and potential identification of Significant Wildlife Habitat. Twelve ESAs have been identified within the Project Study Area, seven of which are located in the 120 m Area of Investigation (Figure 2.1). These seven ESAs are listed below with brief descriptions, summarized from ABCA's Environmentally Significant Areas Report (1984):

STE-4-A: ..... This site forms part of the headwaters of Parkhill Creek and is known locally as Mud Creek. Species of trees located in this swamp include red and silver maple, basswood, elm, cedar and some bitternut hickory. Ground conditions displayed moisture slightly below the surface, however much of the forested area is only seasonally wet. The Mud Creek Drain and Pfaff Drain cut across this property.

STE-5-C: ..... This site consists of two separate wetland areas having a water table slightly below the ground surface. Upland forest communities and cultivated farmland surround this site. A strip of cultivated land separates the two sections of this woodlot. This wetland augments the flow of Mud Creek as well as serving a minor water storage function. It has, however, been greatly affected by adjacent land draining operations.

STE-7-A: ..... This woodlot includes the ABCA's 40 ha Stephen Wildlife Area and a 40 ha ABCA/MNR Agreement Forest. This site also contains Canadian Forestry Service Experimental Plots. There are five small wetland areas identified through this large woodlot. The woodland is generally a sugar maple upland forest. These range from a small pond to patches of a silver maple and yellow birch swamp. There are two municipal drains that runs through the property.

STE-10-A: ..... Approximately 60% of this site is made up of ABCA/MNR Agreement Forest. A large soft maple swamp exists in the southern section of this property. Several smaller wetland areas occur throughout the remainder of the ESA. A heavily channelized stream passes through this site and empties into Parkhill Creek.

STE-11-A: ..... Approximately 280 ha of this site is owned and managed as an ABCA/MNR Agreement Forest. The north half of the site is comprised of a coniferous plantation. Many small swampy areas are located throughout the woodland. Natural upland areas along the drier but still moist sandy ridges consist of trembling aspen, poplar, white birch and some sugar maple. There are four drains that traverse the area.

STE-14-C: ..... A well-defined valley system containing wetland species along the floodplain dominates this ESA. Dogwood, willow, elm, trembling aspen and poplar provide vegetative cover for the valley floor and walls. The large amount of vegetation in this woodlot does serve to protect the valley walls from erosion as well as to filter runoff.

STE-17-C: ..... Approximately one half of this site consists of soft maple swamp. The surrounding woodland community is best described as an immature lowland forest consisting of poplar, trembling aspen, elm, hawthorn and white ash with willow and dogwood in the understorey. A municipal drain runs through the centre of the site including the largest wetland area.

These ESAs were assessed to determine whether they contain candidate significant wildlife habitat or wetlands during the Site Investigation phase of this NHA.

Significant Wildlife Habitat

Significant wildlife habitat is grouped into four categories as per the Significant Wildlife Habitat Technical Guide (MNR, 2000), as follows: Seasonal Concentration Areas, Rare Vegetation Communities or Specialized Habitats for Wildlife, Animal Movement Corridors and Habitat of Species of Conservation Concern. The following sections describe records review results related to significant wildlife habitat types within these categories.

Seasonal Concentration Areas

Habitats within the Project Study Area have been identified as habitats of seasonal concentrations of animals and/or possessing characteristics that make them potential habitats of seasonal concentrations. Based on the natural heritage background information reviewed and on direct input from MNR on seasonal concentration areas of animals, the following habitats were carried forward to Phase 2 (site investigation) of the NHA:

Colonial-nesting Bird Breeding Habitat (bank and cliff swallows, tree/shrub, ground):

According to information provided by MNR during this Records Review, known Great Blue Heron nesting habitats are present to the north of the Project Study Area (MNR, 2011d and MNR, 2012). According to the Atlas of the Breeding Birds of Ontario, there is evidence of breeding for several colonial nesting breeding birds including Bank Swallow, Cliff Swallow, Northern Rough-winged Swallow, Great Blue Heron and Green Heron in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Bank Swallows, Cliff Swallows, Northern Rough-winged Swallows, Great Blue Herons and Herring Gulls were recorded during spring and summer avian surveys conducted by Golder in the Project Study Area (Golder Associates, 2011). Northern Rough-winged Swallows, Great Blue Herons and Green Herons were also recorded by AECOM during breeding bird surveys conducted in the Wind Energy Centre Study Area (Appendix D). Suitable habitats for colonial-nesting birds may occur in the Project Study Area.

Waterfowl Stopover and Staging Areas (terrestrial and aquatic):

Two flocks of approximately 2000 to 5000 Tundra Swans were observed feeding in fields just outside of the southwest corner of the Project Study Area during the spring Tundra Swan/Waterfowl Survey

conducted in March 2010 (Golder Associates, 2011). Additional locations were identified during Tundra Swan migration surveys conducted by AECOM in 2012, through correspondence with the Lambton Heritage Museum, and by local residents through personal correspondence and information obtained at public meetings and site meetings. Tundra Swans were observed in nine additional locations within the Project Study Area, including locations within the 120 m Area of Investigation (Table 2.4). The general locations where Tundra Swans were observed are shown on Figure 2.1.

Table 2.4 Tundra Swan Observations in Vicinity of Project Study Area

Feature No.	Observations	Source of Information
WSST-08	Approximately 280 Tundra Swans observed feeding in field during 2012 Tundra Swan survey.	2012 Tundra Swan surveys (AECOM)
WSST-14	Two flocks of approximately 2000 and 5000 Tundra Swans observed feeding in fields during 2010 Tundra Swan survey. Several flocks of 10 to 600 Tundra Swans observed feeding in field during 2012 Tundra Swan survey. Annual use of site by Tundra Swans recorded by Lambton Heritage Museum and reported by resident through personal correspondence.	2010 (Golder, 2011) and 2012 (AECOM) Tundra Swan surveys; Lambton Heritage Museum; local residents.
WSST-15	Tundra Swans feeding in field reported by resident through personal correspondence. Approximately 1860 Tundra Swans observed feeding in field during 2012 Tundra Swan survey. Annual use of site by Tundra Swans reported by resident through personal correspondence.	2012 Tundra Swan survey (AECOM); local residents.
WSST-16	Tundra Swans feeding in field reported by resident through personal correspondence. Approximately 160 Tundra Swans observed feeding in field during AECOM roadside survey. Annual use of site by Tundra Swans reported by resident through personal correspondence.	2012 Tundra Swan survey (AECOM); local residents.
WSST-32	Approximately 1000 Tundra Swans feeding in field reported by resident through personal correspondence. Annual use of site by Tundra Swans reported by resident at public meeting.	Local residents
WSST-33	Approximately 220 Tundra Swans feeding in field reported by resident through personal correspondence. Annual use of site by Tundra Swans reported by resident through personal correspondence.	Local residents
WSST-34	Approximately 100 Tundra Swans feeding in field reported by resident through personal correspondence.	Local residents
WSST-35	Approximately 200 Tundra Swans feeding in field reported by resident through personal correspondence.	Local residents
WSST-36	Annual use of site by Tundra Swans reported by local residents at public meetings and through personal correspondence.	Local residents
WSST-37	Annual use of Tundra Swans reported by resident during site meeting.	Local residents

Wood Ducks, American Widgeons, Canada Geese, Common Mergansers, Red-breasted Mergansers and Mallards were also observed within the Project Study Area during spring migration surveys conducted by Golder and AECOM. According to information provided by the MNR during the Records Review, waterfowl stopover and staging areas may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Waterfowl Nesting Areas:

According to the Atlas of the Breeding Birds of Ontario there is breeding evidence for American Black Duck, Northern Pintail, Gadwall, Blue-winged Teal, Green-winged Teal, Northern Shoveler, Mallard and Wood Duck in the vicinity of the Project Study Area (Cadman *et al.* 2007). Wood Duck and Mallard were identified during spring and summer avian surveys conducted in the Project Study Area by Golder Associates in 2010 and AECOM in 2011. Suitable breeding habitats for these species may occur in the Project Study Area.

Shorebird Migratory Stopover Areas (shorebird staging):

Spotted Sandpiper, Least Sandpiper and Upland Sandpiper were recorded during spring avian surveys conducted in the Project Study Area (Golder Associates, 2011). According to information provided by MNR during this Records Review, shorebird migratory stopover and staging areas may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Raptor Winter Feeding and Roosting Areas (raptor wintering areas):

Rough-legged Hawk and Red-tailed Hawk were observed during winter avian use surveys conducted in the Project Study Area (Golder Associates, 2011). According to information provided by MNR during this Records Review, raptor winter feeding and roosting areas may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Reptile Hibernacula:

According to the Ontario Herptofaunal Summary Atlas (accessed April 2, 2012), the following snake species are known to occur in the vicinity of the Project Study Area: Eastern Garter Snake, Brown Snake, Northern Redbelly Snake, Northern Water Snake and Smooth Green Snake (Oldham and Weller, 2000). Suitable hibernacula for these species may occur in the Project Study Area.

Bat Hibernacula and Maternity Colonies:

According to the Ontario Ministry of Northern Development and Mines (MNDM) Abandoned Mines Information System (AMIS), (Ontario Ministry of Northern Development and Mines, 2012) there are no abandoned mines in the vicinity of the Project Study Area.

There are several features which have the potential to contain suitable habitat for bat hibernacula or maternity colonies, including known and inferred karst topography as well as woodlands. Inferred karst occurs across the Project Study Area (MNDM, 2012a). Karst is susceptible to the creation of geologic features, such as caves, which may be suitable for bat hibernacula (MNDM, 2012a). Woodlands in the Project Study Area may contain a sufficient density of snags or cavity trees which could provide suitable habitat for bat maternity colonies. Bat species known to occur in the vicinity of the Project Location include Little Brown Bat (*Myotis lucifugus*), Big Brown Bat (*Eptesicus fuscus*), Eastern Red Bat (*Lasiurus borealis*), and Hoary Bat (*Lasiurus cinereus*) (Dobbyn 1994). Suitable hibernacula or maternity colony habitats for these species may occur in the Project Study Area.

Amphibian Breeding Habitat (woodland, wetland):

According to the Ontario Herpetofaunal Summary Atlas (accessed April 2, 2012), the following amphibian species are known to occur in the vicinity of the Project Study Area: American Toad, Spring Peeper, Western Chorus Frog, Gray Treefrog, Wood Frog, Northern Leopard Frog, Green Frog, Bullfrog, Common Mudpuppy, Eastern Newt, Jefferson/Blue-Spotted Salamander Complex and Northern Redback Salamander (Oldham and Weller, 2000). Suitable breeding habitats for these species may be located in woodland and wetland areas in the Project Study Area.

Each of these habitats was assessed during site investigations to determine if they are present or absent in the 120 m Area of Investigation.

Based on consultation with MNR (personal communication, 2011), the following habitats were not carried forward to Phase 2 (site investigation) of the NHA:

- Wild Turkey winter range: these habitats are known to be common with a lack of site fidelity from winter to winter.

According to the MNR's NRVIS mapping, a deer wintering area is located outside the Project Location but within the 120 m Area of Investigation (approximately 23 m from the access road to Turbine 5, on the opposite side of Babylon Line), in association with the Hay Swamp Life Science Area of Natural and Scientific Interest (ANSI) and Provincially Significant Wetland. According to the wetland evaluation for Hay Swamp (MNR, 1987), this feature is considered of regional significance for winter cover that serves as a Stratum 2 deer wintering area for White-tailed Deer. Although the Hay Swamp deer wintering area occurs within 120 m of the Project Location, it is not Provincially significant and therefore was not carried forward to site investigation.

Rare Vegetation Communities or Specialized Habitats for Wildlife

Based on the natural heritage background information reviewed, and on direct input from MNR, on rare vegetation communities or specialized habitats for wildlife, the following habitats were carried forward to Phase 2 (site investigation) of the NHA:

Rare Vegetation Communities:

According to information provided by MNR during this Records Review, alvars, tall-grass prairies, savannahs, Provincially rare forest types (i.e., ranked S1 to S3), cliffs, talus slopes, rock barrens, sand barrens and Great Lake dunes may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Habitat for Area Sensitive Species (interior forest breeding birds, open country breeding birds):

According to the Atlas of the Breeding Birds of Ontario, there is evidence of breeding of interior forest breeding birds including Red-breasted Nuthatch, Blue-headed Vireo, Black-throated Green Warbler, Blackburnian Warbler, Winter Wren, Pileated Woodpecker, Yellow-bellied Sapsucker, Veery, Ovenbird and Scarlet Tanager in the general vicinity of the Project Study Area (Cadman *et al.* 2007). With respect to open country breeding birds, there is breeding evidence for, Eastern Meadowlark, American Kestrel, Upland Sandpiper, Grasshopper Sparrow, Northern Harrier, Savannah Sparrow and Vesper Sparrow in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Suitable habitats for these species may be present in the Project Study Area.

Old-growth or Mature Forest Stands:

According to information provided by MNR during this Records Review, old-growth or mature forest stands may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Turtle Habitat (nesting, over-wintering):

According to the Ontario Herpetofaunal Summary Atlas (accessed April 12, 2012), Snapping Turtle and Midland Painted Turtle are known to occur in the vicinity of the Project Study Area. Suitable nesting and overwintering habitats for these species may occur in the Project Study Area.

Woodland Raptor Nesting Habitat:

According to the Atlas of the Breeding Birds of Ontario, there is confirmed evidence of breeding for Red-tailed Hawk and Cooper's Hawk and possible evidence for Sharp-shinned Hawk, Broad-winged Hawk and Barred Owl in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Northern Goshawk, Cooper's Hawk and Sharp-shinned Hawk were recorded in the Project Study Area during spring/summer avian surveys (Golder Associates, 2011). Red-shouldered Hawk was also recorded in the Project Study Area during breeding bird surveys conducted by AECOM (Appendix D). Suitable nesting habitats for these species may occur in the Project Study Area.

Bald Eagle Nesting Habitat:

According to the Atlas of the Breeding Birds of Ontario, there is possible evidence of breeding for Bald Eagle in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Bald Eagle was recorded during winter and fall surveys but not during spring and summer surveys conducted in the Project Study Area (Golder Associates, 2011). Suitable nesting habitat for Bald Eagle may occur in the Project Study Area.

Osprey Nesting, Foraging and Perching Habitat:

According to the Atlas of the Breeding Birds of Ontario, there is no evidence of breeding for Osprey in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Osprey was recorded during summer and fall surveys conducted in the Project Study Area (Golder Associates, 2011). According to information provided by MNR during this Records Review, Osprey nesting, foraging and perching habitat may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Seeps and Springs:

According to information provided by MNR during this Records Review, seeps and springs may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

Marsh Bird Breeding Habitat:

According to the Atlas of the Breeding Birds of Ontario, there is breeding evidence for Sora, American Coot, Pied-billed Grebe and Green Heron in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Suitable breeding habitat for these species may occur in the Project Study Area. Common Loon was recorded during spring, summer and fall avian surveys, Green Heron was recorded during summer avian surveys and Trumpeter Swan was recorded during the spring avian survey conducted in the Project Study Area (Golder Associates, 2011). Green Heron was also recorded in the Project Study Area during breeding bird surveys conducted by AECOM. Suitable breeding habitat for these marsh birds may occur in the Project Study Area.

These features were assessed during site investigations to determine if they are present or absent in the 120 m Area of Investigation.

Based on consultation with MNR (personal communication, 2011), the following habitats were not carried forward to Phase 2 (site investigation) of the NHA:

- Forests providing high diversity of habitats and/or highly diverse areas: the criteria used to define these habitats are redundant with other evaluation criteria applied to wildlife habitat and woodlands. Mitigation will be prescribed according to these other significance designations; and
- Foraging areas with abundant mast (mast producing areas): these habitats are relevant to more northerly locations, where forest stands providing hard mast (e.g., oak and beech nuts) can be important food resources for Black Bear.

Animal Movement Corridors

No known animal movement corridors were identified in the Project Study Area. Large vegetated corridors occur in the western portion of the Project Study Area along Corbett Line and through the central portion of the Project Study Area associated with Hay Swamp. Hedgerows can serve as smaller, local linkages between woodlots. Animal movement corridors were assessed during site investigations to determine if they are present or absent in or within the 120 m Area of Investigation.

Species of Conservation Concern

As defined in the *Significant Wildlife Habitat Technical Guide* (MNR, 2000), species that may be considered species of conservation concern include:

- *species identified as Nationally Endangered or Threatened by the Committee on the Status of Endangered Wildlife in Canada, which are not protected in regulation under Ontario's Endangered Species Act;*
- *species identified as Provincially Special Concern (formerly Vulnerable) based on lists of Vulnerable, Threatened, Endangered or Extirpated Species of Ontario that are updated periodically by the OMNR;*
- *species that are listed as rare or historical in Ontario based on records kept by the Natural Heritage Information Centre in Peterborough (S1 is extremely rare, S2 is very rare, S3 is rare to uncommon);*
- *species whose populations are known to be experiencing substantial declines in Ontario;*
- *species that have a high percentage of their global population in Ontario and are rare or uncommon in the planning area;*
- *species that are rare within the planning area, even though they may not be Provincially rare;*
- *species that are subjects of recovery programs; and*
- *species considered important to the municipality, based on recommendations from the Conservation Advisory Committee.*

The NHIC data and information provided by MNR for the preparation of this Records Review were used to identify Species of Conservation Concern that occur or have the potential to occur within the Project Study Area.

Information pertaining to species designated as Endangered or Threatened in the Province of Ontario is excluded from this report. As noted above, Endangered and Threatened species are addressed through a parallel Species at Risk review and approval process under the Endangered Species Act (2007) administered by the MNR Guelph District.

Based on the natural heritage background information reviewed and on direct input from MNR regarding Species of Conservation Concern, the following habitats and features were carried forward to Phase 2 (site investigation) of the NHA:

- Special Concern and Provincially rare species (plants and animals);
- Shrub/early successional bird breeding habitat; and
- Terrestrial Crayfish

Table 2.5 lists the species of conservation concern that were identified through the Records Review as occurring or having the potential to occur within the Project Study Area. This table was compiled with results from a search of the NHIC database, conducted in April 2012 and on records identified in correspondence from MNR for this Records Review. In total, 63 species of conservation concern, including 60 Provincially rare species (i.e., species that are ranked S1 to S3), 15 Special Concern species, and one species listed as Endangered federally but not provincially, have been identified as potentially occurring within the Project Study Area.

Descriptions of the preferred habitat of each species were obtained from Appendix G of the Significant Wildlife Habitat Technical Guide (MNR, 2000) and are included in Table 2.5. The presence/absence of suitable habitats for species of conservation concern within the 120 m Area of Investigation was determined during the site investigation.

Shrub/Early Successional Bird Breeding Habitat:

According to the Atlas of the Breeding Birds of Ontario, there is breeding evidence for Brown Thrasher, Clay-coloured Sparrow, Field Sparrow, Black-billed Cuckoo, Eastern Towhee and Willow Flycatcher in the general vicinity of the Project Study Area (Cadman *et al.* 2007). Suitable breeding habitat for these species may occur in the Project Study Area. Brown Thrasher was recorded during spring, summer and fall avian surveys, Field Sparrow and Willow Flycatcher were recorded during spring and summer avian surveys, Clay-colored Sparrow and Black-billed Cuckoo were recorded during summer avian surveys and Eastern Towhee was recorded during summer and fall avian surveys conducted in the Project Study Area (Golder Associates, 2011). Brown Thrasher, Field Sparrow, Black-billed Cuckoo, Eastern Towhee and Willow Flycatcher were also recorded in the Project Study Area during breeding bird surveys conducted by AECOM. Suitable breeding habitat for these bird species may occur in the Project Study Area.

Terrestrial Crayfish:

According to information provided by MNR during this Records Review, terrestrial crayfish may occur in the Project Study Area (MNR, 2011d and MNR, 2012).

2.2.2.5 Areas of Natural and Scientific Interest (ANSIs)

The Ontario Ministry of Natural Resources (MNR) evaluates ANSIs to determine whether they are Provincially or Regionally (locally) significant. This evaluation takes into consideration the value of the area for conservation, scientific study and education. Provincially Significant ANSIs are protected under section 2.1 of the *Provincial Policy Statement* (2005), which prohibits development and site alteration in (Provincially) significant ANSIs and on adjacent lands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

ANSIs are designated as Earth Science or Life Science depending on whether they contain significant geological features (e.g., rock, fossil and landform features) or biological feature (e.g., natural landscapes, ecological communities, plant and animal species), respectively.

Table 2.5 Species of Conservation Concern

Common Name	Scientific Name	G-rank[1]	S-rank[2]	COSEWIC Status[3]	MNR Status[4]	Preferred Habitat	Last Observed Date	Source
PLANTS (45 species)								
American Gromwell	*Lithospermum latifolium*	G4	S3	-	-	Species occurs on river floodplains, woods and edges of woods.	5/27/1989 H	NHIC
A Moss	*Astomum muehlenbergianum*	G5	S2	-	-		5/4/1966 H	NHIC; MNR Correspondence
Autumn Coral-root	*Corallorhiza odontorhiza*	G5	S2	-	-	Species occurs in open, oak-pine woods or occasionally in open, red pine or white pine plantations		MNR Correspondence
Burning Bush	*Euonymus atropurpureus*	G5	S3	-	-	Species occurs in dry to moist thickets and woods	11/21/1983 H	NHIC
Carolina Whitlow-grass	*Draba reptans*	G5	S3	-	-	Primarily inhabits dry sandy areas, dry open flats and limestone pavements.	5/5/1958 H	NHIC
Chinese Hemlock Parsley	*Conioselinum chinense*	G5	S2	-	-	Species inhabits calcareous cedar swamps, wet borders of streams and rivers. Also found among seepage slopes.	9/1/1986 H	NHIC
Crowned Beggarticks	*Bidens trichosperma*	G5	S2	-	-	Found in openings in swamps, marshes, along shores, and wet fields.	1936 H	NHIC; MNR Correspondence
Dwarf Chinquapin	*Quercus prinoides*	G5	S2	-	-	Occurs in open, dry sandy places, savannahs	7/26/1999	NHIC
Eastern Green-violet	*Hybanthus concolor*	G5	S2	-	-	Occurs in rich, wet-mesic floodplain forests as well as mesic forests over limestone.	5/27/1989 H	NHIC
False Tomentose Balsam Groundsel	*Packera paupercula var. pseudotomentosa*	G5TNR	S2S3	-	-	Species occurs in prairies, sandy open woods and savannah	5/15/1990	NHIC
Fogg's Goosefoot	*Chenopodium foggii*	G2G3	S2	-	-	Species occurs in sandy areas on limestone under oak or pine-oak forests	8/18/1975 H	NHIC
Giant Ironweed	*Vernonia gigantean*	G5	S1?	-	-	Found in mesic prairies, thickets, moist woods, roadsides and grassy meadows	11/21/1983 H	NHIC
Great Lakes Sand Reed	*Calamovilfa longifolia var. magna*	G5T3T5	S3	-	-	Species occurs in active sand dunes, open sand plains, and openings in forests on stabilized sand dunes	9/30/2004	NHIC
Green Dragon	*Arisaema dracontium*	G5	S3	SC	SC	Species found in bottomlands often along rivers and creeks.	2000	NHIC, MNR Correspondence
Hairy Bedstraw	*Galium pilosum*	G5	S3	-	-	Occurs in dry, sandy woods and thickets; occasionally in dry sandy fields	7/26/1999	NHIC
Hairy Valerian	*Valeriana edulis*	G5	S1	-	-	Inhabits swampy river flats and meadows, wet prairies, and wooded, rocky riverbanks.		MNR Correspondence
Hairy Wood Mint	*Blephilia hirsute*	G5?	S1	-	-	Species found in woodlands, preferably rocky, and especially among rivers.	09/05/59 H	NHIC; MNR Correspondence
Harbinger-of-spring	*Erigenia bulbosa*	G5	S3?	-	-	Occurs in rich, moist deciduous woods, especially on floodplains.		MNR Correspondence
Hill's Pond Weed	*Potamogeton hillii*	G3	S2	SC	SC	Aquatic plant found in highly alkaline waters of ditches, and ponds.		MNR Correspondence
Large Round-leaved Orchid	*Platanthera macrophylla*	G4	S2	-	-	Species inhabits moist mixed woods.	1867 H	MNR Correspondence
Lizard's Tail	*Saururus cernuus*	G5	S3	-	-	Species inhabits shores and streambanks along shallow water.	8/17/2005	NHIC
Moss Phlox	*Phlox subulata*	G5	S1?	-	-	Species is found in open, sandy woods, and sandy roadsides and lakeshores	5/24/1906 H	NHIC
Narrow-leaved Puccoon	*Lithospermum incisum*	G5	S1	-	-	Occurs in dune, savannah, sandy woods and dry ground	5/24/1906 H	NHIC
Pawpaw	*Asimina triloba*	G5	S3	-	-	Species occurs in moist woods and stream banks	6/16/1959 H	NHIC
Pillose Evening Primrose	*Oenothera pilosella*	G5	S2	-	-	Found in moist edges of woods and waste ground, prairie	6/25/1919 H	NHIC
Prostrate Tick-trefoil	*Desmodium rotundifolium*	G5	S2	-	-	Species occurs in sandy woods	7/1/1970 H	NHIC
Pumpkin Ash	*Fraxinus profunda*	G4	S2?	-	-	Occurs in swamps and floodplains	1994	NHIC
Ram's-head Lady's-slipper	*Cypripedium arietinum*	G3	S3	-	-	Found in cedar woodlands, limestone plains and wooded fens.	1994	NHIC
Rattlesnake Hawkweed	*Hieracium venosum*	G5	S2	-	-	Species inhabits open, dry sandy woods.	07/04/56 H	NHIC; MNR Correspondence
Round-leaved Groundsel	*Packera obovata*	G5	S3	-	-	Found in moist woods	7/25/1987 H	NHIC
Round-leaved Hawthorn	*Crataegus lumaria*	G3G4	S3?	-	-	Species occurs in old fields, poorly managed pastures, fencelines and roadsides	5/31/1978 H	NHIC
Scarlet Beebalm	*Monarda didyma*	G5	S3	-	-	Found in moist woods, thicket swamps and floodplains.	7/1/1900 H	NHIC; MNR Correspondence
Shore Bluestem	*Schizachyrium littorale*	G5T5	S2?	-	-	Occurs in sand dunes and sandy shores of the lower Great Lakes	9/13/2000	NHIC
Slender Blazing Star	*Liatris cylindracea*	G5	S3	-	-	Species occurs in limestone and dolostone pavement, prairies, open woods	10/1/2004	NHIC
Slender Knotweed	*Polygonum tenue*	G5	S2	-	-	Found in dry, sandy, open areas in deciduous (often oak woods), prairie meadows; at edges of sand pits	8/6/1964 H	NHIC
Slender Vulpia	*Vulpia octoflora*	G5	S2	-	-	Species inhabits dry, sandy sites including meadows, dry forests, and stabilized dunes.	6/10/1970 H	NHIC
Slim-flowered Muhly	*Muhlenbergia tenuiflora*	G5	S2	-	-	Found in rich deciduous forest, often on rocky or sandy soils.		MNR Correspondence
Slim-spiked Three-awned Grass	*Aristida longespica var. longespica*	G5T5?	S2	-	-	Species inhabits dry to moist sandy fields and sandy openings in prairies	9/19/1989 H	NHIC
Stiff Gentian	*Gentianella quinquefolia*	G5	S2	-	-	Found in moist soils of streambanks, edges of woods and wet prairies.	1982 H	NHIC; MNR Correspondence
Sundial Lupine	*Lupinus perennis*	G5	S3	-	-	Inhabits dry, sandy oak savannahs and prairies	5/31/2000	NHIC
Tall Blazing Star	*Liatris aspera*	G4G5	S2	-	-	Occurs in open, sandy woods, dry roadsides and sandy prairies	7/26/1999	NHIC
Tuberous Indian Plantain	*Arnoglossum plantagineum*	G4G5	S3	SC	SC	Species occurs in wet, calcareous meadows or shoreline fens.		MNR Correspondence
Woodland Pinedrops	*Pterospora andromedea*	G5	S2	-	-	Species found in conifer woods, under pine.	7/11/1936 H	NHIC
Yellow Ladies'-tresses	*Spiranthes ochroleuca*	G4	S2	-	-	Found in sandy meadows and prairies.	10/12/1942 H	NHIC
Yellow Stargrass	*Hypoxis hirsute*	G5	S3	-	-	Occurs in dry open sandy woods; wet to dry meadows and prairies	6/24/1983 H	NHIC
BIRDS (7 species)								
Bald Eagle	*Haliaeetus leucocephalus*	G5	S3B	-	SC	Nests in tall trees often near shore. Feeds on fish in large open water bodies.		MNR Correspondence
Common Nighthawk	*Chordeiles minor*	G5	S4B	THR	SC	Species inhabits open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.		MNR Correspondence
Horned Grebe	*Podiceps auritus*	G5	S1B, S4N	-	SC	Species inhabits deep water marshes or sloughs with a mix of open water and emergent vegetation; small freshwater ponds or protected bays of larger lakes with emergent vegetation.	Fall, 2010	Golder Avian Use Report, 2011
Louisiana Waterthrush	*Seiurus motacilla*	G5	S3B	SC	SC	Species prefers wooded ravines, and swamps and mature forests with closed canopy. This species nests on the ground.	5/17/1984 H	NHIC; MNR Correspondence
Red-headed Woodpecker	*Melanerpes erythrocephalus*	G5	S4B	THR	SC	Species inhabits open, deciduous forest with little understorey; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.		MNR Correspondence
Short Eared Owl	*Asio flammeus*	G5	S2N, S4B	SC	SC	Species can be found in grasslands, marshes, and bogs. Species is a ground nester. s. It requires 75-100 ha of contiguous open habitat.		MNR Correspondence
Yellow-breasted Chat	*Icteria virens*	G5	S2B	SC	SC	Species inhabits large thicket habitats; nests above ground in bush, vines etc.		MNR Correspondence

Table 2.5 Species of Conservation Concern

Common Name	Scientific Name	G-rank[1]	S-rank[2]	COSEWIC Status[3]	MNR Status[4]	Preferred Habitat	Last Observed Date	Source
INSECTS (7 species)								
Azure Bluet	*Enallagma aspersum*	G5	S3	-	-	Species inhabits small ponds and bogs.	7/8/1997	NHIC
Dusted Skipper	*Atrytonospsis hianna*	G4G5	S1	-	-	Species is confined to remnants of dry prairie, and sand dune areas.	5/28/1990	NHIC
Monarch Butterfly	*Danaus plexippus*	G5	S2N, S4B	SC	SC	Species can be found in any open habitat, especially where milkweed occurs.		MNR Correspondence
Mottled Duskywing	*Erynnis martialis*	G3	S2	-	-	Usually seen nectaring or on wet sandy roads with of other species of Erynnis.	5/29/1990	NHIC
Sleepy Duskywing	*Erynnis brizo*	G5	S1	-	-	Species occurs in open oak woods	5/23/1992	NHIC
Tawny Emperor	*Asterocampa clyton*	G5	S2S3	-	-	Species is restricted to areas where Hackberry grows.	7/3/1994	NHIC
West Virginia White	*Pieris virginiensis*	G3G4	S3	-	SC	This species is restricted to rich deciduous woods, where its foodplant Toothwort occurs.		MNR Correspondence
REPTILES & AMPHIBIANS (3 species)								
Eastern Ribbonsnake	*Thamnophis sauritus*	G5	S3	SC	SC	Occurs in wet meadows, marshes or sphagnum bogs, usually near water such as ponds, or streams. Species hibernates in groups.	5/31/1987[H]	NHIC; MNR Correspondence
Milksnake	*Lampropeltis triangulum*	G5	S3	SC	SC	Species inhabits abandoned farmlands, meadows thickets and woodlands. Often found hiding under stones, or under boards	8/22/1988[H]	NHIC; MNR Correspondence
Snapping Turtle	*Chelydra serpentina*	G5	S3	SC	SC	Requires permanent, semi-permanent fresh water, including marshes, swamps rivers and streams. Nests in open habitats on south-facing slopes. Hibernates in mud under water.		MNR Correspondence
MAMMALS (1 species)								
Little Brown Bat	*Myotis lucifugus*	G5	S4	END	-	Species uses caves, quarries, tunnels, hollow trees or buildings for roosting near wetlands or forest edges where it can feed. It overwinters in humid caves. Maternity sites are found in dark warm areas such as attics and barns.		Atlas of the Mammals of Ontario (Dobbyn, 1994)

[1] ***G-rank*** *G Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and The Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies or variety. Definitions are as follows:*
G1.....Extremely rare; usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2.....Very rare; usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
G3.....Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4.....Common; usually more than 100 occurrences; usually not susceptible to immediate threats.
G5.....Very common; demonstrably secure under present conditions.

[2] ***S-rank:*** *The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNR Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities.*
Definitions are as follows: S1 ... Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.
S2 ... Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.
S3 ... Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.
S4 ... Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.
S5 ... Very common and demonstrably secure in Ontario.
SE ... Exotic; not believed to be a native component of Ontario's flora.
*SH ... **Possibly Extirpated (Historical)—** Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.*

[3] ***COSEWIC Status*** *COSEWIC (Committee on the Status of Endangered Wildlife in Canada) assigns a federal status ranking for all species that it assesses.*
EXT .... Extinct. A species that no longer exists
EXP .... Extirpated. A species that no longer exists in the wild in Canada, but occurring elsewhere in the world
END .... Endangered. A species facing imminent extirpation or extinction throughout its range.
THR .... Threatened. A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
SC ..... Special Concern. A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species.
IND ..... Indeterminate. A species for which there is insufficient information to support a status designation.
NAR .... Not at Risk. A species that has been evaluated and found to be not at risk.
**..... Indicates a species found on Schedule 1 of the federal Species At Risk Act.*

[4] ***MNR Status:*** *Based on consultation with COSSARO (Committee on the Status of Species at Risk in Ontario). COSSARO is the Ministry of Natural Resources (MNR) committee that evaluates the conservation status of species occurring in Ontario.*
Definitions are as follows: EXT ... Extinct. A Species that no longer exist anywhere.
EXP ... Extirpated. Any native species no longer existing in the wild in Ontario, but existing elsewhere in the wild.
END R ... Endangered (Regulated). A species facing imminent extinction or extirpation in Ontario which has been regulated under Ontario's Endangered Species Act
END ... Endangered (not regulated). A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under the Ontario Endangered Species Act
THR ... Threatened. Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its Ontario range if the limiting factors are not reversed.
SC ... Special Concern [formerly Vulnerable].A species with characteristics that make it sensitive to human activities or natural events.
NAR ... Not at Risk [formerly Not In Any Category]. A species that has been evaluated and found not to be at risk.
DD ... Data Deficient [formerly Indeterminate]. Any native species for which there is insufficient scientific information on which to base a status recommendation

Life Science ANSIs

According to the MNR's NRVIS mapping (MNR, 2011b), there are two Life Science ANSIs within the Project Study Area, both of which are Regionally Significant.

The Natural Heritage Information Centre (NHIC) Natural Area Record describes the Hay Swamp ANSI as a "lowland swamp forest on spillway supporting small sections of sugar maple bush with lowland (red maple swamp) forest and associated wetlands predominating. Communities present include red maple, black ash, trembling aspen-red maple. The site is an important water storage area and contains the headwaters for Black Creek, a tributary of the Ausable River" (MNR, 2011a). The Hay Swamp ANSI occurs within the Project Study Area, but outside the Project Location. In one location (Babylone Line, north of Pepper Road), Hay Swamp ANSI occurs within the 120 m Area of Investigation, approximately 70 m from the Project Location.

Khiva Conservation Forests is described as gently rolling wet mesic to mesic mixed forest of sugar maple-ash-beech with hemlock-red-maple-witch hazel and pockets of wet, dead elm-ash-white birch forest. The forest is classified as an intermediate-aged forest containing moss hummocks. The conservation forest also contains old fields, old logging roads and some areas, current logging roads (MNR, 2011a). Khiva Conservation Forests occurs immediately outside of the Project Location (>0.1 m at closest point), and within the 120 m Area of Investigation along its north and west edges (east of Blackbush Line).

Although the Hay Swamp and Khiva Conservation Forest Life Science ANSIs both occur within the Project Study Area and fall within 120 m of the Project Location, they are not Provincially Significant Life Science ANSIs and therefore were not carried forward to site investigation.

Earth Science ANSIs

According to the MNR's NRVIS mapping (MNR, 2011b), there is one Provincially Significant Earth Science Area of Natural and Scientific Interest (ANSI) located within the Project Study Area (Figure 2.1). The Lucan Moraine ANSI exhibits Late Wisconsinan, Port Bruce Stadial, Lucan Moraine, Rannoch Till, Kirkton Esker, outwash terraces and outwash. This ANSI is representative of the deglaciation of the St. Mary's map area as the Huron ice lobe retreated to the west. The glacial landscape is well preserved (MNR, 2011a). The Lucan Moraine is located along the southeastern limit of the Transmission Line Study Area, but outside of the Area of Investigation (approximately 240 m from the Project Location).

Although the Lucan Moraine Earth Science ANSI is a Provincially Significant Earth Science ANSI, it does not occur within 120 m of the Project Location and therefore was not carried forward to site investigation.

According to the MNR's NRVIS mapping (MNR, 2011b), there is one Regionally Significant Earth Science ANSI located within the Project Study Area (Figure 2.1). According to the Natural Heritage Information Centre (NHIC) Natural Area Record, Dashwood Area Moraine covers an area of 763 ha and contains Late Wisconsinan, Port Huron Stadial, Wyoming Moraine, St. Joseph Till, melt water channel and Lake Warren beach. The site is representative of the Wyoming Moraine in the Grand Bend- Parkhill area. The glacial features were deposited by the Huron ice lobe (MNR, 2011a). The Dashwood Area Moraine occurs within the Project Location and its associated 120 m Area of Investigation in areas between west of Goshen Line and west of Parr Line and between Dashwood Road and Huron Street.

Although the Dashwood Area Earth Science ANSI occurs within the Project Study Area and falls within 50 m of the Project Location, it is not a Provincially Significant Earth Science ANSI and therefore was not carried forward to site investigation.

2.3 Summary of Key Findings of the Records Reviews

Table 2.6 summarizes the natural features identified through the Records Review as occurring or potentially occurring in the Project Location or its associated 120 m Area of Investigation; these are the features that were carried forward to the Site Investigation. Site investigation was required to confirm the presence and boundaries of these features, as well as to determine whether any additional natural features are present in the 120 m Area of Investigation.

Table 2.6 Summary of Natural Features within 120 m Area of Investigation Identified Through the Records Review

Feature	Results of Records Review
Provincially Significant Wetlands	No Provincially Significant Wetlands were identified within 120 m of the Project Location. Unevaluated wetlands may be present within the 120 m Area of Investigation; their presence/absence will be determined during site investigations.
Significant Coastal Wetlands	No significant coastal wetlands were identified within 120 m of the Project Location.
Significant ANSIs (Life Science)	No significant Life Science ANSIs were identified within 120 m of the Project Location.
Significant ANSIs (Earth Science)	No significant Earth Science ANSIs were identified within 50 m of the Project Location.
Significant Valleylands (South and East of the Canadian Shield)	No known Significant Valleylands were identified within 120 m of the Project Location. Watercourses in the 120 m Area of Investigation may be associated with valleyland features and will be assessed during site investigations.
Significant Woodlands (South and East of the Canadian Shield)	Woodlands have been identified in the 120 m Area of Investigation, including woodlands identified as significant in municipal official plans. Woodlands in the 120 m Area of Investigation will be assessed during site investigations.
Significant Wildlife Habitat	Significant Wildlife Habitats have been identified within the Project Study Area and may occur in the 120 m Area of Investigation. Several features and type of significant wildlife habitat were identified within the Project Study Area in background documents and through consultation with MNR, ABCA, UTRCA and local municipalities, and may occur in the 120 m Area of Investigation. Sixty-three species of conservation concern were identified as potentially occurring within the Project Study Area. This information will form the basis for the assessment and potential identification of candidate significant wildlife habitat in the 120 m Area of Investigation during site investigations.
Provincial Parks and Conservation Reserves	No provincial parks or conservation reserves were identified within 120 m of the Project Location.

The following features were carried forward to site investigation to determine their presence/absence within the 120 m Area of Investigation: wetlands, woodlands, valleylands and significant wildlife habitat.

3. Site Investigation

3.1 REA Requirements

As required under the REA process, detailed site investigations were completed in accordance with O.Reg. 359/09. This site investigation report was prepared in accordance with O.Reg. 359/09 and the Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2011).

MNR was consulted on proposed work plans and field protocols for the Goshen Wind Energy Centre site investigations including:

- Proposed Work Plan, Goshen Wind Energy Centre Natural Heritage Assessments, submitted June 8, 2010 to Guelph District MNR (response received August 31, 2010).
- Proposed Site Investigation field protocols, submitted May 9, 2011 to Guelph District MNR (response received May 16, 2011).
- Meeting to discuss the Goshen Wind Energy Centre Natural Heritage Assessment on July 25, 2011 in Burlington, Ontario.
- Meeting to discuss the Goshen Wind Energy Centre Natural Heritage Assessment on September 20, 2011 in Markham, Ontario.

Information collected during the Records Review was used to guide the site investigations. The presence and boundaries of features identified during the Records Review were confirmed, and any changes were noted. Any additional features not identified through the Records Review but identified through the site investigation as occurring within the 120 m Area of Investigation were also described.

3.2 Site Investigation Methods

Site investigations were conducted for features within the 120 m Area of Investigation, which encompasses the Project Location and an additional 120 m surrounding the Project Location. In order to facilitate site investigation data collection and reporting, “natural areas” were identified and their boundaries delineated as contiguous natural areas (e.g., comprised of woodland, wetland, successional vegetation communities, or a combination thereof). Each natural area was assigned a unique identifier. Site investigation survey data were initially organized according to natural areas (as defined above) rather than natural features as defined within the REA process (i.e., woodlands, wetlands, valleylands, Significant Wildlife Habitat), because the identification of these features relies on the results of site investigation surveys. Survey data were later analyzed to identify natural features (i.e., woodlands, wetlands, valleylands, Significant Wildlife Habitat), as required by the REA process.

Natural features identified through the Records Review were assessed to determine their composition, form and function. Any corrections to the Records Review, including changes to the boundaries of natural features or new features, were identified, as documented in Section 3.3. The following sections describe the methods used to conduct site investigations. Appendix B contains detailed site investigation field notes, Appendix C contains qualifications (i.e., curriculum vitae) for all investigators, and Appendix E documents weather conditions during field investigations.

3.2.1 Ecological Land Classification (ELC) and Vascular Plant Surveys

Field surveys to classify vegetation communities and identify vascular plant species composition within the 120 m Area of Investigation were conducted during the period of May 30, 2011 to July 12, 2012. Survey dates are provided in Table 3.3.

All natural areas occurring within the Project Study Area were initially identified to the ELC Community Series level through aerial photography interpretation. On-site field surveys of each natural area falling within the 120 m Area of Investigation were conducted where permission to enter was available. If property access was unavailable at the time of site investigations, an Alternative Site Investigation was conducted following the protocols described in Section 3.2.2 of this report. Reconnaissance site investigations were also conducted to confirm the presence/absence of additional natural areas not identified through aerial photography interpretation.

Vegetation communities were described using the Ecological Land Classification (ELC) for Southern Ontario (Lee *et al.*, 1998). ELC is the provincially accepted standard for classifying vegetation communities in Ontario, and provides methods for identifying and mapping areas in a form that is useful for land use planning. This protocol distinguishes vegetation communities based on stand structure and composition which includes the compilation of a floral species list noting dominant species within each vegetation layer and a delineation of vegetation communities into Ecological Land Classification units.

This protocol uses a series of 6 levels (Site Region, System, Community Class, Community Series, Ecosite and Vegetation Type) each giving context to the site from largest to finest scale. Wherever possible, communities were described to Vegetation Type which is the finest level of classification. However, in some cases where Alternative Site Investigations were conducted, including where aerial photography was used for the assessment, vegetation communities were described to Ecosite and/or to Community Series. The ELC assessment consisted of a combination of soil profile analysis, basal area prism sweeps, and multilayer (canopy, sub-canopy, and ground cover) vegetation inventories.

During site investigations it became apparent that some of the vegetation communities observed did not fit within the existing ELC designations for Vegetation Type, therefore, AECOM staff have created a list of “new” ELC codes (e.g., CUT1a, FOD4a, etc.) for the purposes of this project. These are presented in Appendix F.

Vascular plant inventories were completed in conjunction with vegetation community surveys, where possible. Plant species were considered rare if designated provincially as S1 (Extremely rare in Ontario), S2 (Very rare in Ontario), or S3 (Rare to uncommon in Ontario), or locally rare in Huron County by Oldham (1993). Species having a high coefficient of conservatism (8, 9 or 10) as designated by Oldham *et al*. (1995) were also considered species of interest due to their fidelity to specific habitats.

3.2.2 Alternative Site Investigation

In certain instances, it was necessary to conduct an Alternative Site Investigation, as described in Part IV, Section 26 of O.Reg. 359/09. Alternative site investigations were completed when access to private property was not granted and on-site investigations could not be conducted as per Section 3.2.1 above. Alternative Site Investigations were completed using aerial photograph interpretation as well as field observations including observations made from the nearest property where entry was granted (fence line surveys) and observations made from a municipal or provincial road right-of-way (roadside surveys). Through aerial photography and visual field observations, vegetation communities in these natural areas were identified to the lowest possible level using the Ecological Land Classification for Southern Ontario.

Table 3.1 provides a summary of the Alternative Site Investigations conducted for the Goshen Wind Energy Centre, including the reason why a site investigation could not be conducted and how information pertaining to the natural area was obtained. The locations of specific natural areas are shown on Figures 3.2a, b and c (Wind Energy Centre Study Area), as well as Figures 3.2d and e (Transmission Line Study Area).

Table 3.1 Alternative Site Investigations

Natural Area	Date of Alternative Site Investigation	Method of Alternative Site Investigation	Rationale for Alternative Site Investigation
189	November 7, 2011	In the south end of the natural area, a fence line survey of the FOD7d community was conducted from the property immediately west.	Did not have permission to enter properties on which this natural area is located.
	April 26, 2012	In the mid-portion of the natural area, a fence line survey of the FOD9-4 community was conducted from the property immediately west.	
	July 4, 2012	In the north end of the natural area, a fence line survey of the SWD2-2 community was conducted from the property immediately west.	
190	October 14, 2011	A roadside survey of the FOD5-8 and CUW1m communities was conducted from South Road along the north side of the natural area.	Did not have permission to enter property on which this natural area is located.
215	November 8, 2011	A fence line survey of the FOD4f community was conducted from the property immediately west of the natural area.	Did not have permission to enter property on which this natural area is located.
220	April 26, 2012 May 18, 2012	A roadside survey of the CUM1-1 community was conducted from Grand Bend Line along the east side of the natural area.	Did not have permission to enter property on which this natural area is located.
229	November 9, 2011 April 24, 2012	A fence line survey of the FOD5-6 community in the north end of the natural area was conducted from the property in the southern portion of the natural area.	Did not have permission to enter property on which this natural area is located.
232	September 15, 2011 April 25, 2012	A fence line survey of the FOD5-5 and FOD3-1 communities in the northeast end of the natural area was conducted from the properties immediately east.	Did not have permission to enter property on which this natural area is located.
236	November 9, 2011	A fence line survey of the FOD9-4 community was conducted from the property line to the west and south of the natural area.	Did not have permission to enter property on which this natural area is located.
240	December 13, 2011 April 24, 2012	A fence line survey of the FOD7-2 community was conducted from the property line to the north of the natural area.	Did not have permission to enter property on which this natural area is located.
244	April 27, 2012	A fence line survey of the FOD6-5 community to the south was conducted from the northern portion of the natural area.	Did not have permission to enter property on which this natural area is located.
249	April 27, 2012 July 4, 2012	A fence line survey of the OAO and SWD2-2 communities was conducted from the fence line to the south.	Did not have permission to enter property on which this natural area is located.
255	May 9, 2012	A roadside survey of the FOM5-2 community was conducted from Crediton Road to the south and Corbett Line to the east.	Did not have permission to enter property on which this natural area is located.
261	April 24, 2012 June 7, 2012	A fence line survey of the FOD6-5 community in the central portion of the natural area was conducted from the adjacent properties.	Did not have permission to enter property on which this natural area is located.
266	September 7, 2011 April 24, 2012	A roadside survey of the FOD4a and CUP3-2 communities in the north end of the feature was conducted from Black bush Line to the north-west of the natural area.	Did not have permission to enter property on which this natural area is located.
274	May 2, 2012	A roadside survey of the MAM3-2 and SWD6-3 communities was conducted from Kirkton Road to the north of the natural area.	Did not have permission to enter property on which this natural area is located.
300	September 21, 2011	In the north end of the natural area, a roadside survey of the SWD3-3 community was conducted from Huron Street to the north of the natural area.	Did not have permission to enter property on which this natural area is located.
	May 2, 2012	In the south end of the natural area, a roadside survey of the FOD7c community was conducted from Kirkton Road to the south of the natural area.	
331	July 4, 2012	A fence line survey of the FOD5-2 community was conducted from the property line to the west.	Did not have permission to enter property on which this natural area is located.
339	September 7, 2011	A fence line survey of the SWD3-3 and FOD5-2 community was conducted from the roadside and property line to the east.	Did not have permission to enter property on which this natural area is located.
352	July 19, 2011	A fence line survey of the FOD5-2 community was conducted from the property line within/ to the south of the natural area.	Did not have permission to enter property on which this natural area is located.
358	September 7, 2011 November 9, 2011	A fence line survey of the FOD5-2 community was conducted from the property line to the north and east of the natural area.	Did not have permission to enter property on which this natural area is located.
361	December 12, 2011 July 3, 2012	Fence line and roadside surveys of the FOD7-2 community were conducted from the property line to the south and from Bronson Line to the east.	Did not have permission to enter property on which this natural area is located.
362	June 7, 2012	A fence line survey of the FOD8-1 community was conducted from the property line to the south.	Did not have permission to enter property on which this natural area is located.
370	June 11, 2012	A fence line survey of the CUP2a community was conducted from the fence line to the north.	Did not have permission to enter property on which this natural area is located.
609	May 31, 2012	A fence line survey of the northern portions of the SWT2-2 and SWD2-2 communities was conducted from the fence line to the south.	Did not have permission to enter property on which this natural area is located.

Table 3.1 Alternative Site Investigations

Natural Area	Date of Alternative Site Investigation	Method of Alternative Site Investigation	Rationale for Alternative Site Investigation
635	June 5, 2012	A fence line survey of the CUM1-1 community was conducted from the property line to the south.	Did not have permission to enter property on which this natural area is located.
702	May 8, 2012	A fence line survey of the FOD9-1 community was conducted from the property line to the west of the natural area.	Did not have permission to enter property on which this natural area is located.
723	June 6, 2012	A fence line survey of the FOD6-5 community was conducted from the properties to the west and north of the natural area.	Did not have permission to enter property on which this natural area is located.
756	n/a	Air photo interpretation of the MAS community.	Air photo interpretation was conducted as we could not access the natural area.

3.2.3 Wetlands and Coastal Wetlands

Through the Records Review, the boundaries of evaluated (identified by MNR) and unevaluated wetlands (identified by Conservation Authorities) were initially identified within the Project Study Area. The boundaries of these wetlands were confirmed and additional wetlands were identified during site investigations where field surveys were initially undertaken between May 2011 and December 2011, and between March 2012 and July 2012 according to the Ontario Ministry of Natural Resources' Ontario Wetland Evaluation System (OWES) (MNR, 2002). Field personnel consisted of certified Ontario Wetland Evaluator biologists. Qualifications (i.e. curriculum vitae) for field personnel and weather conditions during site investigations are summarized in Appendices C and E, respectively. Survey dates are provided in Table 3.3.

Wetland boundaries were delineated using standardized methods as outlined within the OWES manual for Southern Ontario. More specifically, the wetland boundary was delineated where 50% of the physical area was covered by wetland indicator species and 50% by upland plant species (MNR, 2002). Obligate and facultative wetland species identification was based on indicator species outlined in Appendix 5 of the OWES manual (MNR, 2002), Wetland Plants of Ontario (Newmaster *et al.*, 1997) as well as using the Coefficient of Wetness Index in Oldham *et al.* (1995). Tree and/or shrub forms were used as the best indicators for long term site conditions. Where woody vegetation species did not clearly indicate upland or wetland areas, other vegetation forms were used.

The Coefficient of Wetness is one component of the "Floristic Quality Assessment System for Southern Ontario" (Oldham *et al.*, 1995). This system provides a numerical ranking of the relative affinity for wet soil conditions for native plant species. For the purposes of the wetland index, plants are designated as:

Obligate Wetland (-5):..... almost always occurs in wetlands under natural conditions (estimated probability >99%);

Facultative Wetland (-4 to -2): ..... usually occurs in wetlands, but occasionally found in non-wetlands (estimated probability 67 to 99%);

Facultative (-1 to 1):..... equally likely to occur in wetlands or non-wetlands (estimated probability 34 to 66%);

Facultative Upland (+2 to +4): ..... occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated probability 1 to 33%); and

Obligate Upland (+5):..... occurs almost never in wetlands under natural conditions (estimated probability <1%).

Plant species can exist as distinct ecotypes, which can tolerate different moisture regimes. For example, red maple (*Acer rubrum*), which has a Wetness Index value of 0, demonstrates high genetic variability between ecodistricts and can be found in very dry conditions and in areas where hydric soils or saturated conditions prevail. To further

support the wetland boundary determination, a soil profile analysis was also taken within select wetland areas to determine the presence/absence of hydric soils. Hydrologic conditions, including the presence of seeps, were also assessed. The vegetation community analysis was also referenced to provide confirmation that adjacent communities were in fact upland in nature.

Wetland features occurring within 120 m of the Project Location were identified as individual wetlands or wetland complexes meeting the minimum size requirements for evaluation outlined in OWES (MNR, 2002), as follows:

- According to the OWES manual, wetlands smaller than 2 ha are generally not evaluated. In this assessment, all individual wetland communities or contiguous groups of wetland communities greater than 2 ha in size were identified as wetland features. Those located at least partially within 120 m of the Project Location were carried forward to the Evaluation of Significance. When wetland units 2 ha or greater were observed the criteria for complexing wetlands outlined in OWES manual, were applied as described below.
- Wetlands smaller than 2 ha can however sometimes provide important habitat for wildlife or be important for other reasons and therefore may be evaluated if there is a rationale for including them. This is particularly true in wetland complexes. In this Natural Heritage Assessment, individual wetland communities or contiguous groups of wetland communities less than 2 ha in size but greater than 0.5 ha in size were assessed to determine whether they are functionally linked and no more than 750 m away from the outer boundary of a wetland feature greater than 2 ha in size. If these criteria were met, the wetland communities were complexed together, as per the wetland complexing procedure described in the OWES manual. Wetland complexes located at least partially within 120 m of the Project Location were carried forward to the Evaluation of Significance. If these criteria were not met, the wetland was assessed to determine whether it provides an important ecological function, such as rare species, seepage or linkage functions.
- According to the OWES manual, isolated individual wetland communities or contiguous groups of wetland communities that are less than 0.5 ha in size generally do not meet the minimum size requirements for mapping purposes, provided they do not contain rare wetland communities or species. Therefore wetlands less than 0.5 ha in size where no seepages, rare communities or rare species were encountered during site investigations were not identified as wetland features.

Wetland data were collected during the 2011 field season using the standard ELC data cards. In 2012, wetland data cards were created using standard OWES criteria (e.g. Wetland Type, Site Type, Presence of Groundwater, % Open Water). Field notes including wetland data cards are provided in Appendix B.

A small inclusion located in the northern portion of natural area 720 is dominated by basswood. No ELC code is suitable for a community dominated by basswood hence the use of FOD7. This is a very disturbed community with the ground cover layer being dominated by garlic mustard, common dandelion, burdock, spotted geranium, herb-robert, and yellow trout lily. No evidence of wetland plants or standing water was observed and therefore the inclusion was not considered to be a wetland community.

3.2.4 Woodlands

Woodland or forested areas were initially identified through the Records Review and aerial photography interpretation. The presence, boundaries and composition of woodlands were then confirmed at the time of vegetation community surveys during site investigations wherever they occurred within the 120 m Area of Investigation.

Ecological vegetation community mapping was used to identify woodlands according to the definition of woodlands provided in O. Reg. 359/09, as amended through O. Reg. 521/10, whereby 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.

Woodland features were identified according to the procedures described in the Natural Heritage Assessment Guide which states that “a bisecting opening 20 m or less in width between crown edge is not considered to divide a woodland into two separate woodlands and the area of the developed opening (e.g. maintained public opening or rail line) is not included in the wooded area calculation”. Woodland features were therefore established by grouping qualifying ELC polygons located within 20 m or less of each other. Woodland features located at least partially within the 120 m Area of Investigation were carried forward to the Evaluation of Significance.

3.2.5 Valleylands

The Natural Heritage Assessment Guide defines valleylands as a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. Potential valleylands were initially identified through interpretation of flood limit and topographic mapping overlaid on ortho-imagery. The presence of valleyland features and their boundaries, attributes and composition was subsequently confirmed during site investigation where field surveys were undertaken within the 120 m Area of Investigation in May, 2012.

To determine the presence/absence of candidate significant valleylands, Section 5.5 of the Natural Heritage Assessment Guide was referenced. This section explains how to define the physical boundaries of well-defined valleys and less well-defined valleys. For well-defined valleys, the physical boundary is defined by the stable top-of-bank or the predicted top-of-bank. For less well-defined valleys, the physical boundary is defined in a number of ways including the consideration of riparian vegetation, the flooding hazard limit, the meander belt or the highest general level of seasonal inundation.

Additional information was collected during site investigations in order to evaluate identified valleylands using the criteria described in Section 6.2.3 of the Natural Heritage Assessment Guide including:

- Surface water functions;
- Degree of naturalness;
- Linkage functions; and
- Restoration: existing/committed projects.

Valleyland features occurring at least partially within the 120 m Area of Investigation were carried forward to the Evaluation of Significance.

3.2.6 Wildlife Habitat

Field investigations to identify candidate Significant Wildlife Habitat located with 120 m of the project location were conducted in conjunction with Ecological Land Classification (ELC) mapping and vascular plant surveys from May 2011 to December 2011 and March 2012 to July 2012. These surveys were generally conducted between 7:00 am and 6:00 pm. The dates on which specific surveys were conducted are provided in Table 3.3. Qualifications (i.e. curriculum vitae) for field personnel and weather conditions during site investigations are summarized in Appendices C and E, respectively.

As described in the Natural Heritage Assessment Guide, candidate Significant Wildlife Habitats were identified using criteria established by MNR in the Significant Wildlife Habitat Technical Guide (MNR, 2000) and through consultation

with MNR wildlife biologists. Bat-related habitats were also assessed with reference to the draft and final versions of *Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR 2010a and MNR 2011e).

The determination of the presence or absence of candidate Significant Wildlife Habitat located at least partially within the 120 m Area of Investigation was initiated through the identification and delineation of ELC communities and completion of vascular plant species inventories as described in Section 3.2.1 of this report. Incidental wildlife observations were also recorded during site investigations. In addition, site investigation surveys focused on identifying Significant Wildlife Habitat triggers including vernal pools, potential hibernacula (e.g., rock piles), raptor nests or tree cavities. For data collection in the 2012 season, Significant Wildlife Habitat field data cards were created to facilitate the efficient application of criteria used to identify candidate Significant Wildlife Habitats. A summary of the criteria and methods used to identify each type of candidate Significant Wildlife Habitat is provided in Table 3.2. These criteria have been assembled from the following sources:

- Significant Wildlife Habitat Technical Guide (MNR, 2000);
- Draft version of Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR 2010a);
- Final version of Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR, 2011e);
- Draft Ecoregion 6E Criterion Schedule Addendum to the Significant Wildlife Habitat Technical Guide (MNR, 2011f); and,
- Draft Ecoregion 7E Criterion Schedule Addendum to the Significant Wildlife Habitat Technical Guide (MNR, 2011g).

Because the Project Study Area is located at the approximate boundary between Ecoregions 6E and 7E, the draft Criterion Schedules for both Ecoregions were examined to identify criteria for consideration candidate Significant Wildlife Habitat. Where differences between the two criterion schedules were noted, the most inclusive criterion was applied (i.e., the criterion resulting in treatment of more features as candidate Significant Wildlife Habitat). These criteria are presented in Table 3.2.

Wherever a feature met the criteria outlined in Table 3.2 for a particular habitat type, Appendix D of the Natural Heritage Assessment Guide was consulted to determine whether the feature should be carried forward to the Evaluation of Significance as candidate Significant Wildlife Habitat or as generalized candidate Significant Wildlife Habitat. Appendix D of the Natural Heritage Assessment Guide sets out the criteria for identifying candidate Significant Wildlife Habitat required to be identified based on occurrence within 120 m of specific types of project infrastructure (refer to *Table 16 – Candidate SWH required to be identified within 120 metres of the project location based on project location component*). Candidate Significant Wildlife Habitats which are not required to be identified based on their proximity to Project infrastructure were treated as generalized candidate Significant Wildlife Habitat.

3.2.6.1 Bat Habitat Assessment Surveys

NRSI conducted site investigations in June 2010 and June 2011 based on the guidance material that was available at the time, which included the Draft Ecoregion Criteria Schedules Addendum (MNR 2009) and Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR, 2010a). Criteria used to identify candidate bat maternity colonies included the presence of snags or live cavity trees which were greater than 20 cm diameter at breast height (dbh) with exfoliating bark and/or cavities. In addition, any suitable candidates had a clear entranceway to the cavity or surrounding exfoliating bark.

Site investigations conducted after June of 2011 followed the most recent MNR guidance document, Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR, 2011e), which indicates that the number of wildlife trees per hectare should be determined using 0.05 ha plots (or circular plots with a radius of 12.6 m), which are randomly

placed throughout each woodland being investigated. The document stipulates that a minimum of 10 plots should be used for woodlands which are 10 ha or less in size, with one additional plot for every additional hectare for larger woodlands (up to a maximum of 35 plots). Woodlands with greater than or equal to 10 wildlife trees (cavity trees) per hectare qualify as candidate significant bat maternity colony habitats. NRSI followed this protocol for woodlands which had not been previously investigated, randomly selecting circular plots 12.6 m in radius within the portions of woodlands for which access was granted. All dead trees or snags (with or without cavities) and live trees containing cavities which were greater than 25 cm dbh were initially counted. Following clarification of the intention of the guidance documents during a field session with MNR in March of 2012, only those live trees or snags that contain cavities were counted. Re-assessment of previously assessed woodlands was determined not to be necessary because the former method of counting all snags (with or without cavities) is more conservative (i.e. more likely to meet the threshold density of cavity trees) than the latter method of counting only those snags with cavities.

NRSI's complete report describing bat habitat assessment surveys is provided in Appendix G.

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Seasonal Concentration Areas		
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff Swallows)	• Presence of the following Ecosites[2]: CUM1, CUT1, CUS, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1; • Eroding banks, sandy hills, pits, steep slopes, and rock faces that are undisturbed or naturally eroding for 10 years or more; and, • Significant habitats are not located in licensed aggregate pits.	• Search for presence of earthen banks on air photo mosaics within project area. • Search for presence of earthen banks where suitable ecosites encountered during ELC field investigations.Record location of any potentially qualifying features.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrub)	• Presence of the following Ecosites: SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1; • Significant sites generally have better habitat quality (e.g. optimal vegetation composition, abundant food); and, • Size of habitat and level of disturbance are also important.	• Search for presence of treed wetlands (e.g. mixed or deciduous swamps or treed fen habitats) on air photo mosaics within project area. • Search for presence of large stick nests (particularly where more than one) where suitable ecosites encountered during site investigation. • Record location of any nests, as well as the size of the habitat and evidence of disturbance.
Colonial-Nesting Bird Breeding Habitat (Ground)	• Any (rocky) island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map); • Significant sites generally have better habitat quality (e.g. optimal vegetation composition, abundant food); and, • Size of habitat and level of disturbance are also important.	• Search for presence of rocky islands or peninsulas within lakes or large rivers on air photo mosaics within project area. • Search for presence of rocky islands or peninsula where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Waterfowl Stopover and Staging Areas (Terrestrial)	• Presence of the following Ecosites: CUM1, CUT1; and • Evidence of annual spring flooding from melt water or runoff.	• Search for presence of cultural meadows or cultural thicket communities that may provide spring flooding or runoff on air photo mosaics within project area. • Search for evidence of annual or frequent spring flooding or runoff where suitable ecosites encountered during site investigation. • Determine if areas show evidence of extensive seasonal flooding to host large numbers of staging waterfowl. • Record location and physical attributes of any potentially qualifying features.
Waterfowl Stopover and Staging Areas (Aquatic)	• Presence of the following Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, SWD1, SWD3; • Where standing water is present including ponds, marshes, lakes, bays, coastal inlets and watercourses during migration; • Significant sites generally have better habitat quality (e.g. optimal vegetation composition, ratio of open water to emergent vegetation; extensive shoreline; abundant food, nocturnal roosting cover); and, • Larger wetlands are more significant (size).	• Search for presence of marsh, shallow water or deciduous swamp communities large enough to act as waterfowl staging areas on air photo mosaics within project area. • Search for presence of marsh, shallow water or deciduous swamp communities large enough to act as waterfowl staging areas where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.

1. *Derived from the following sources:*
   - *Significant Wildlife Habitat Technical Guide (MNR, 2000);*
   - *Draft and final versions of Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR 2010 and 2011);*
   - *Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR, 2011);*
   - *Draft Ecoregion 6E Criterion Schedule Addendum to the Significant Wildlife Habitat Technical Guide (MNR, 2011a); and,*
   - *Draft Ecoregion 7E Criterion Schedule Addendum to the Significant Wildlife Habitat Technical Guide (MNR, 2011b).*
2. *Ecosites are defined as "*mappable, landscape units integrating a consistent set of environmental factors and vegetation characteristics*" (Lee* et al*., 1998).*

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Waterfowl Nesting Areas	• All upland habitats located adjacent to (within 150 m of) the following Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4; or upland habitats adjacent to (within 150 m of) Provincially Significant Wetlands; • Upland areas should be at least 120 m wide so that predators have difficulty finding nests; • Larger sites of suitable habitat are more significant; • Significant sites generally have better habitat quality (e.g. optimal vegetation structure, stable water levels, abundant cover); and, • Sites wilt little disturbance (e.g. from agricultural activities such as hay cultivation or cattle grazing) are more significant.	• Search for upland habitat located near marshes or other wetland/open water areas on air photo mosaics within project area. • Search for upland habitat located near suitable wetland ecosites when encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Shorebird Migratory Stopover Areas (Shorebird Staging)	• Presence of the following Ecosites: BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1, MAM2, MAM3, MAM4, MAM5; and, • Shorelines of lakes, rivers and wetlands, including beach areas, bars, seasonally flooded shoreline, mudflats, rock groynes, and other forms of armour rock lakeshore.	• Search for stretches of undisturbed landscape found along shorelines of lakes, rivers and wetlands on air photo mosaics within project boundaries. • Search for presence of mudflats or shorelines adjacent to large open water area during site investigation. • Record location and physical attributes of any potentially qualifying features.
Raptor Winter Feeding and Roosting Areas (Raptor Wintering Areas)	• Combination of ELC Community Series; presence of one Community Series from each land class: ▪ Forest: FOC, FOD, FOM; ▪ Upland: CUM, CUT, CUS, CUW; • Sites must be at least 20 ha in size, with a combination of forest and upland habitats; • Upland communities must be >15 ha in size; • Sites that are less disturbed by agricultural activities are more significant; and, • Sites with better habitat quality (e.g., abundant prey and perches; a tendency toward less snow accumulation due to exposure to strong prevailing winds) are probably more significant.	• Search for fields and open meadows on air photo mosaics within project area that are >15 ha in size and adjacent to forest habitats. • Search for fields that provide a variety of herbaceous plant species which offer seeds, nuts, fruit and leafy plant matter throughout the year which supports high populations of prey (small mammals and ground nesting birds) where suitable ecosites encountered during site investigations. • Record location and physical attributes of any potentially qualifying features.
Reptile Hibernacula	• No ELC Ecosites are directly related to these habitats. Areas of broken and fissured rock, rock piles or slopes, stone fences, crumbling foundations, and old wells are candidate SWH.	• Search for presence of wooded areas adjacent to fields or thickets on air photo mosaics within project area. • Search for areas of broken and fissured rock, rock piles or slopes, stone fences, crumbling foundations, and old wells during site investigation. • Record location and physical attributes of any potentially qualifying features.
Bat Hibernacula	• All caves, abandoned mine shafts, underground foundations, karst, or one of the following Ecosites: CCR1, CCR2, CCA1, CCA2 (buildings are not to be considered SWH).	• Search for presence of caves, mine shafts, underground formations and karst within project area. • Record location and physical attributes of any potentially qualifying features.
Bat Maternity Colonies	• Presence of all Ecosites associated with the following ELC Community Series: FOD and FOM; • Forests that have >10/ha cavity trees (snags or cavity trees) which are >25 cm diameter at breast height (dbh); and, • 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.	• Search for presence of deciduous or mixed forest communities on air photo mosaics within project area. • Search for presence of forests that have a high density of cavity trees (snags or cavity trees) which are >25 cm dbh during site investigation. • Record location and physical attributes of any potentially qualifying features.

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Amphibian Breeding Habitat (Woodland)	• Presence of all Ecosites associated with the following ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD; • Woodland with a wetland, lake or pond, including breeding pools that may be permanent, seasonal, ephemeral, and located within or adjacent to (within 120 m of) the woodland; • To be significant, vernal ponds in woodlands should persist until mid-July; and, • Wetlands used for breeding with presence of shrubs and logs around the edges are more significant because of increased structure for calling, foraging, escape and concealment from predators.	• Search for presence of forests and swamps on air photo mosaics within project area. • Search for permanent or temporary wooded pools that are likely to hold water until July and have depths of at least 50 cm in early spring where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Amphibian Breeding Habitat (Wetland)	• Presence of the following Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, SWT1; or presence of the following ELC Community Classes: SW, MA, FE, BO, OA and SA; • Larger sites of suitable habitat are more significant; • Wetlands used for breeding with presence of shrubs and logs around the edges are more significant because of increased structure for calling, foraging, escape and concealment from predators; and, • Wetlands and pools (including vernal pools) >500 m^2 (about 25 m diameter) isolated from woodlands (>120 m) supporting high species diversity are more significant.	• Search for presence of meadow marsh, shallow marsh, and other suitable ecosites on air photo mosaics within project area. • Search for presence of temporary or permanent standing water where suitable ecosites encountered during site investigation. • Search for pools that are likely to hold water until July and have depths of 50 cm in early spring where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Rare Vegetation Communities		
Alvars	• Presence of any of the following Ecosites: ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2; • Sites must be at least 0.5 ha in size; and, • Sites must not be dominated by non-indigenous species.	• Search for presence of alvars on air photo mosaics within project area. • Search for presence of savannahs and document all flora during site investigation. • Record location and physical attributes of any potentially qualifying features. • Refer to Appendix N of the *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and determine whether alvar indicator species are present.
Tall-grass Prairies	• Presence of any of the following Ecosites: TPO1, TPO2; • Sites with ground cover dominated by prairie grasses and less than 25% tree cover; • Site conditions must be restored or natural (e.g., not railway right-of-ways); and, • Sites must not be dominated by non-indigenous species.	• Search for presence of tall-grass prairies on air photo mosaics within project area. • Search for presence of tall-grass prairies and document all flora during site investigation. • Record location and physical attributes of any potentially qualifying features. • Refer to Appendix N of the *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and determine whether tall grass prairie indicator species are present.
Savannahs	• Presence of any of the following Ecosites: TPS1, TPS2, TPW1, TPW2, CUS2; • Tallgrass prairie habitat with tree cover between 25% and 60%. Site conditions must be restored or natural (e.g., not railway right-of-ways); and, • Sites must not be dominated by non-indigenous species.	• Search for presence of savannahs on air photo mosaics within project area. • Search for presence of savannahs and document all flora during site investigation. • Record location and physical attributes of any potentially qualifying features. • Refer to Appendix N of the *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and determine whether savannah indicator species are present.
Rare Forest Types	• Presence of any rare (S1-S3, SH) forest types.	• Search for presence of rare forest types on air photo mosaics within project area. • Search for presence of rare forest types during site investigation. • Record location and physical attributes of any potentially qualifying features. • Refer to Appendices J and M of *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and determine whether rare forest types are present.

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Cliffs and Talus Slopes	• Presence of any of the following Ecosites: CLO1, CLS1, CLS2, CLT1, CLT2, TAO1, TAO2, TAS1, TAS2, TAT1, TAT2; • Cliffs are greater than 3 m in height of vertical to near-vertical bedrock; and, • A talus slope is rock rubble at the base of a cliff made up of coarse rocky debris.	• Search for presence of cliffs and talus slopes on air photo mosaics within project area. • Search for presence of cliffs and talus slopes during site investigation. • Record location and physical attributes of any potentially qualifying features.
Sand Barrens	• Presence of any of the following Ecosites: SBO1, SBS1, SBT1; • Typically exposed sand habitats, generally sparsely vegetated and caused by lack of moisture, periodic fires, and erosion. Sand barrens 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; and, • Sites must not be dominated by non-indigenous species. • Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always $\leq$ 60%.	• Search for presence of sand barrens on air photo mosaics within project area. • Search for presence of sand barrens during site investigation. • Record location and physical attributes of any potentially qualifying features.
Great Lakes Dunes	• Presence of all Ecosites associated with the following ELC Community Series: SDO, SDS, SDT; and, • Located within 5 km of Lake Huron.	• Search for presence of Great Lakes dunes on air photo mosaics within project area. • Search for presence of Great Lakes dunes during site investigation. • Record location and physical attributes of any potentially qualifying features.
Specialized Habitat for Wildlife		
Habitat for Area Sensitive Species (Interior Forest Breeding Birds)	• Presence of all Ecosites associated with the following ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD; • Large mature (>60 years old) forest (non-plantation) stands or woodlots greater than 10 ha in size; and, • Woodlands with at least 4 ha interior forest habitat (at least 200 m from edge of forest).	• Search for contiguous areas of forest of at least 10 ha, with at least 4 ha of interior habitat on air photo mosaics within project area. • Determine whether large mature trees are present where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Habitat for Area Sensitive Species (Open Country Bird Breeding Habitat)	• Presence of the following Ecosite: CUM1; and, • Grassland areas (includes natural and cultural fields and meadows) greater than 30 ha in size, excluding Class 1 and 2 agricultural lands and lands actively used for farming (i.e., no row-cropping in the last 5 years).	• Search for presence of large patches (>30 ha) of grassland or old field habitat on air photo mosaics within project area. • Search for large grassland patches where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Old-growth or Mature Forests	• Presence of all Ecosites associated with the following ELC Community Series: FOD, FOC, FOM; • Typically relatively undisturbed, structurally complex and contain a wide variety of trees and shrubs in various age classes; • Most significant sites will contain numerous trees which are at least 140 years old. Stands containing younger trees (e.g. 100 years or older) are significant where older trees no longer exist; and, • Stands containing predominantly long-lived species are probably more significant than stands consisting primarily of short-lived species (e.g. trembling aspen, birch).	• Search for forest communities on air photo mosaics within project area. • Search for mature trees in forested areas that have never been cutover (Old-Growth) and mature trees in forest stands consisting of a broad range of tree size classes (Mature Forest Stands) where suitable ecosites encountered during site investigation. • Search for large standing snags and abundance of downed wood in variable sizes where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Turtle Nesting Habitat	• Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1; • Areas of sand and/or gravel that turtles are able to dig in, including sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers; and, • Nesting areas on the sides of municipal and provincial road embankments, railway embankments and active aggregate operations are not SWH.	• Search for presence of open vegetated areas near ponds, marshes, lakes or other water bodies on air photo mosaics within project area. • Search for areas that are elevated and consist of gravel or sandy soils where suitable ecosites encountered during site investigation. • Search for evidence of turtle egg predation (broken turtle shells) where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Turtle Over-wintering Habitat	• Presence of the following Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1; or the following ELC Community Series: FEO, BOO; or the following ELC Community Classes: SW, MA, OA, SA; • Overwintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen; and, • Water has to be deep enough not to freeze and have soft mud substrates.	• Search for presence of ponds, large marshes, lakes or other water bodies on air photo mosaics within project area. • Search for presence of deep ponds, large marshes, lakes or other water bodies during site investigation. • Record location and physical attributes of any potentially qualifying features.
Woodland Raptor Nesting Habitat	• Presence of all Ecosites associated with the following ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD, or the following Ecosite: CUP3; and, • All natural or conifer plantation woodland/forest stands >30 ha with at least 4 ha of interior forest habitat.	• Search for extensive forested areas (>30 ha in size) on air photo mosaics within project area. • Search for large patches of suitable ecosites during site investigation. • Record location and physical attributes of any potentially qualifying features.
Bald Eagle Nesting Habitat	• Presence of all Ecosites associated with the following ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD; • Forest communities directly adjacent to riparian areas of rivers, lakes, ponds, wetlands, and islands; and, • Nests located on man-made objects are not included.	• Search for presence of forest communities directly adjacent to open water on air photo mosaics within project area. • Search for presence of nest bowls where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features and nests.
Osprey Nesting, Foraging and Perching Habitat	• Presence of all Ecosites associated with the following ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD; • Forest communities directly adjacent to riparian areas of rivers, lakes, ponds, wetlands, and islands; and, • Nests located on man-made objects are not included.	• Search for presence of forest communities directly adjacent to open water on air photo mosaics within project area. • Search for presence of nest bowls where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features and nests.
Seeps and Springs	• Seeps and 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 or springs; and, • Seeps were identified using groundwater indicator plants, with reference to McKenny and Peterson (1996), Crow and Hellquist (2000), and Niering and Thieret (2009).	• Search for presence of forest or swamp communities on air photo mosaics within project area. • Search for presence of seeps or springs, and determine presence of indicator species during site investigations. • Record location and physical attributes of any potentially qualifying features.
Marsh Breeding Bird Habitat	• Presence of the following Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1; and, • Wetland habitats containing shallow water and emergent aquatic vegetation.	• Search for presence of large marshes on air photo mosaics within project area. • Search for marshes containing standing water at least 30 cm deep, and where emergent aquatic vegetation is present during site investigation. • Record location and physical attributes of any potentially qualifying features.

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Species of Conservation Concern Identified Through Records Review		
American Gromwell *(Lithospermum latifolium)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Shaded river banks, wooded floodplains [6]. River floodplains, woods and edges of woods. [2] • Corresponding ELC: FOD7	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time - spring[1]).
A Moss (*Astomum muehlenbergianum*) **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Thin soil over level outcrop ledges and on soil under grasses in open prairie. [18] • Corresponding ELC: ALO, TPO	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – spring[18]).
Autumn Coral-root *(Corallorhiza odontorhiza)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Oak-pine woods or occasionally in open, red pine or white pine plantations. Dry, sandy woods. Scattered occurrences are restricted to southern Ontario mainly in the Carolinian zone.[2] • Corresponding ELC: FOM1, FOM2, CUP3	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time - summer to fall, but some years not at all[2]).
Burning Bush (*Euonymus atropurpureus)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Species occurs in dry to moist deciduous thickets and woods.[14, 2] • Corresponding ELC: FOC, FOM, FOD	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – April – June[19]).
Carolina Whitlow-grass *(Draba reptans)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Primarily inhabits dry sandy areas, dry open flats & limestone pavements. Occasionally weedy. [2, 6] • Corresponding ELC: SBO, SBS, SBT, ALO, ALS, ALT	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – mid-March to mid-June[4]).
Chinese Hemlock Parsley *(Conioselinum chinense)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat • Swampy places with deciduous trees, cedars, tamarack; river banks, creek borders[6]. Species inhabits calcareous white cedar swamps, wet borders of streams and rivers. Also found among calcareous seepage slopes. [2]Corresponding ELC: SWC1, SWC3, SWC4, SWM1, SWM2, SWM4, SWM5, SWM6	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time –summer to fall).
Crowned Beggarticks *(Bidens trichosperma)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Found in openings in swamps, marshes, along shores & wet fields within the Carolinian zone and southeastern Georgian bay [2]. Bogs, fens, tamarack swamps [13]. • Corresponding ELC: SWC, SWM, SWD,SWT, MAM, MAS	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – late summer[5]).
Dwarf Chinquapin (*Quercus prinoides)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Occurs in open, dry sandy woods, savannahs. [14, 2] • Corresponding ELC: TPW, TPS	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – mid March to late June[17]).

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Eastern Green-violet *(Hybanthus concolor)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Occurs in rich, wet-mesic floodplain forests as well as mesic forests over limestone [3]. Includes floodplains and river banks [6]. • Corresponding ELC: ALT1, FOD7	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time –mid March to August[4]).
False Tomentose (*Packera paupercula var. pseudotomentosa)* **Species of Conservation Concern** S2S3 (Imperiled to Vulnerable)	• Preferred habitat Species occurs in prairies, sandy open woods and savanna. [2,14] • Corresponding ELC: TPO, TPS, TPW	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey.
Fogg's Goosefoot (*Chenopodium foggii)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species occurs in sandy areas under oak or pine-oak forests[14], or in edges. [2] • Corresponding ELC: TPS, TPW, FOM1, FOM2	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time - Bloom Time – August – September[25]).
Giant Ironweed (*Vernonia gigantea)* **Species of Conservation Concern** Critically Imperiled – S1? (rank uncertain)	• Preferred habitat Found in mesic prairies, thickets, moist woods, roadsides and grassy meadows.[14] • Corresponding ELC: TPO2, TPS2, TPW2	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – early June to the end of August[17]).
Great Lakes Sand Reed (*Calamovilfa longifolia var. magna)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Species occurs in active sand dunes, open sand plains, and openings in forests on stabilized sand dunes. [14] Species is restricted to the sandy shorelines of Lake Huron.[2] Occasionally introduced along roadsides and railways.[2] • Corresponding ELC: SDO1, SBO1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom Time – mid-summer to early fall[1]).
Green Dragon *(Arisaema dracontium)* **Species of Conservation Concern** Vulnerable – S3 **COSEWIC (SC) and MNR Status (SC)**	• Preferred habitat Species found in damp deciduous forest and along river streams [8]. It grows in wet forests particularly Maple forest and forest dominated by Red Ash and White Elm[7]. • Corresponding ELC: FOD6, FOD7, FOD9	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – May and June[8]).
Hairy Bedstraw (*Galium pilosum)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Occurs in dry, sandy woods and thickets; occasionally in dry sandy fields. [2,14] • Corresponding ELC: TPO1, TPS1, TPW1, FOM1, FOM2, FOM3, FOM4, FOD1, FOD2, FOD3, FOD4, FOD5	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – June – August[20]).
Hairy Valerian *(Valeriana edulis)* **Species of Conservation Concern** Critically Imperiled – S1	• Preferred habitat Inhabits swampy river flats and meadows, wet prairies, and wooded, rocky riverbanks [3] and fens [6] • Corresponding ELC: FEO1, FES1, FET1, SWC, SWM, SWD, SWT, TPO, TPS, TPW	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time –June to August[11]).

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Hairy Wood Mint *(Blephilia hirsuta)* **Species of Conservation Concern** **Critically Imperiled – S1**	• Preferred habitat Rich woods, swamp forests, floodplains [6]. Species found in woodlands, preferably rocky, and especially among rivers. • Corresponding ELC: FOD6, FOD7, SWM, SWD	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – summer for a month and a half[10]).
Harbinger-of-spring **(***Erigenia bulbosa)* **Species of Conservation Concern** Vulnerable – S3? (rank uncertain)	• Preferred habitat Occurs in rich, moist deciduous woods, especially on floodplains [2]. • Corresponding ELC: FOD6, FOD7, FOD8, FOD9	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – early to late April[6]).
Hill's Pond Weed **(***Potamogeton hillii)* **Species of Conservation Concern** Imperiled – S2 **COSEWIC (SC) and MNR Status (SC)**	• Preferred habitat Aquatic plant found in highly alkaline waters of ditches, ponds, beaver ponds, and slow-moving cold waters chiefly confined to the Bruce Peninsula and Manitoulin Island, with a few additional records from Grey, Wellington and Peel Counties[2]. • Corresponding ELC: SAS1, SAM1, SAF1	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – summer[11]).
Large Round-leaved Orchid **(*Platanthera macrophylla)* Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species inhabits moist mixed woods. Found in fairly mature, upland sugar maple-beech-eastern hemlock woodlands, a relatively common type of habitat in Ontario although this species is rarely encountered. At least one historic record was found in Huron County[2]. • Corresponding ELC: FOM6, FOM7, FOM8	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – June to August[11]).
Lizard's Tail **(***Saururus cernuus)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Species inhabits shores and streambanks along shallow water. As well as swamps (usually deciduous but sometimes cedar), floodplains, shallow water and mudflats at the borders of streams and ponds [6]. • Corresponding ELC: MAM2, MAM3, MAS2, MAS3, SWD	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – June – September[12]).
Moss Phlox **(*Phlox subulata*)** **Species of Conservation Concern** Critically Imperiled – S1? (rank uncertain)	• Preferred habitat Species is found in open, dry sandy open woods, sandy roadsides and lakeshores[2,14]. • Corresponding ELC: TPS1, CUM, SDO1, SDT1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time Spring[21]).
Narrow-leaved Puccoon **(*Lithospermum incisum)* Species of Conservation Concern** Critically Imperiled – S1	• Preferred habitat Occurs in dune, savannah, sandy woods and dry ground. [2,14] • Corresponding ELC: SDO, TPO1, TPS1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – Mid March – Mid-June[4]).
Pawpaw ***(Asimina triloba)*** **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Species occurs in moist woods and stream banks. [14] Occurs in moist, deciduous woods. [2] • Corresponding ELC: FOD6, FOD7, FOD9	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – March – May[19]).

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Pillose Evening Primrose *(Oenothera pilosella)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Found in moist edges of woods and open, disturbed ground. [2,14] • Corresponding ELC: FOM8, FOD6, FOD7, FOD9, CUM1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – Late Spring – Early Summer[22]).
Prostrate Tick-trefoil (*Desmodium rotundifolium)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species occurs in dry, sandy or rocky woods. [2,14] • Corresponding ELC: TPW1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – July – September[20]).
Pumpkin Ash *(Fraxinus profunda)* **Species of Conservation Concern** Imperiled – S2? (rank uncertain)	• Preferred habitat Occurs in swamps and floodplains.[2,14] • Corresponding ELC: FOD7, SWD	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – Mid March – mid June[17]).
Ram's-head Lady's-slipper (*Cypripedium arietinum)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Found in cedar woodlands, limestone plains and wooded fens. As well as, moist coniferous swamps, dry, sandy woods, and limestone barren [2]. • Corresponding ELC: CUW1, ALO, FET1, SWC	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time –mid May to mid June[2]).
Rattlesnake Hawkweed (*Hieracium venosum)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species inhabits open, dry sandy woods [2].Jack pine, oak, and aspen woodlands [6]. • Corresponding ELC: FOD1, FOD2, FOD3, FOD4, FOD5, FOC1, FOM1, FOM5	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – April – September [11]).
Round-leaved Groundsel *(Packera obovata)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Found in moist woods[14]. • Corresponding ELC: FOD6, FOD7, FOD9	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – May–June[23]).
Round-leaved Hawthorn *(Crataegus lumaria)* **Species of Conservation Concern** Vulnerable – S3? (rank uncertain)	• Preferred habitat Species occurs in old fields, poorly managed pastures, fence lines and roadsides[14]. • Corresponding ELC: CUM1, CUT1, CUS1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey.
Scarlet Beebalm (*Monarda didyma)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Found in moist, rich woods, thicket swamps, banks and floodplains [6]. • Corresponding ELC: FOD6, FOD7, FOD8, FOD9, SWT2, SWT3	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – May to October[3]).

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Shore Bluestem *(Schizachyrium littorale)* **Species of Conservation Concern** Imperiled – S2? (rank uncertain)	• Preferred habitat Occurs in sand dunes and sandy shores of the lower Great Lakes[2,14]. • Corresponding ELC: SDO, SDS, SDT	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey.
Slender Blazing Star *(Liatris cylindracea)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Species occurs in limestone and dolostone pavement, prairies, open woods[14].; alvars and moist sandy meadows[2]. • Corresponding ELC: ALO, TPO, TPS, TPW	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time July – September[11]).
Slender Knotweed *(Polygonum tenue)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Found in dry, sandy, open areas in deciduous (often oak woods), prairie meadows; at edges of sand pits. [14] • Corresponding ELC: SBO, SBS, SBT, TPO1, TPS1, TPW1, FOD1, FOD2	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time June-October[11]).
Slender Vulpia (*Vulpia octoflora)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species inhabits dry, sandy habitats, including rocky woods meadows, dry forests, and stabilized dunes[2]. • Corresponding ELC: SDO1, SDS1, SDT1	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey.
Slim-flowered Muhly (*Muhlenbergia tenuiflora)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Found in rich deciduous forest, often on rocky or sandy soils [2]. Usually found on wooded dunes, hillsides, and riverbanks whether in oak or beech-maple woods[6]. • Corresponding ELC: SDT1, FOD5, FOD9	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey.
Slim-spiked Three-awned Grass *(Aristida longespica var. longespica)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species inhabits dry to moist sandy fields and sandy openings in prairies[14]. • Corresponding ELC: CUM1, TPO	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time - mid-August – October[26]).
Stiff Gentian (*Gentianella quinquefolia)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Found in moist soils of streambanks, edges of woods and wet prairies. As well as, marshy meadows, bluffs and wooded hillsides [6]. • Corresponding ELC: BLO1, BLS1, BLT1, TPO2, TPS2, TPW2, MAM2, FOD7	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – late summer to mid fall[1]).
Sundial Lupine (*Lupinus perennis)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Inhabits dry, sandy oak savannahs and prairies [2]. As well as, open barrens or clearings in woodlands of oak, jack pine, and/or aspen[6]. • Corresponding ELC: TPS1, TPW1, CUW1, RBO, SBO	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time –mid-March to mid-June[4]).

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Tall Blazing Star *(Liatris aspera)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Occurs in open, sandy woods, dry roadsides and sandy prairies[14]. • Corresponding ELC: TPO1, TPS1, TPW1, CUM1	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time - August – October[12]).
Tuberous Indian Plantain (*Arnoglossum plantagineum)* **Species of Conservation Concern** Vulnerable – S3 **COSEWIC (SC) and MNR Status (SC)**	• Preferred habitat Largely restricted to coast of Lake Huron. Occurs mainly in flat, sandy areas of the Bruce Peninsula. A localized species of fens, wet meadows, and calcareous river flats[2]. • Corresponding ELC: FEO, FES, FET, MAM2, MAM3	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time –mid-March to mid-June[4]).
Woodland Pinedrops (*Pterospora andromedea)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Species found in conifer woods, under pines, but also hemlock, spruce, fir, and white cedar. Also in dry or rocky soil, often with common juniper and sometimes aspen or birch [6]. • Corresponding ELC: FOC1, FOC2, FOC3, FOC4	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – summer[11]).
Yellow Ladies'-tresses (*Spiranthes ochroleuca)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Dry, open sites, usually on acidic sandy soil [2]. Also on dry to mesic open woodland, thickets, meadows, barrens, ledges, outcrops, banks and roadsides, old fields [11]. • Corresponding ELC: CUM1, CUT1, CUW1, RBO1, SBO1	• Search for presence of suitable habitat and documentation of all flora during site investigation. • Search for species during vegetation survey (Bloom Time – August to November[11]).
Yellow Stargrass *(Hypoxis hirsute)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Occurs in dry open sandy woods; wet to dry meadows and prairies[2,14]. • Corresponding ELC: TPO1, TPS1, TPW1, CUM1, FOD1, FOD2, FOD3, FOD4, FOD5	• Search for presence of suitable habitat and documentation of all flora during site investigations. • Search for species during vegetation survey (Bloom time – mid spring – early summary [1]).
Bald Eagle *(Haliaeetus leucocephalus)* **Species of Conservation Concern, MNR Status (SC)**	• Preferred habitat Nests in very large trees that afford a good view, often near shore. Feeds on fish in large open water bodies[14]. • Corresponding ELC: Any habitat with suitable nesting location.	• Breeding habitat for this species was assessed as Bald Eagle Nesting Habitat (described above). • Search for presence of suitable habitat and documentation of all birds observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Common Nighthawk *(Chordeiles minor)* **Species of Conservation Concern, COSEWIC (THR) and MNR Status (SC)**	• Preferred habitat Aerial forager that hunts insects over a wide variety of habitats, in particular open or semi-open areas such as farmland, open woodlands, clearcuts, burns, rock outcrops, bogs fens, prairies, gravel pits and urban areas[7]. Nests on ground in a wide range of open, sparse or vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, rock outcrops, rocky barrens, gravel pits and urban rooftops. Sometimes may nest in grasslands, pastures, peat bogs, marshes or lakeshores. • Corresponding ELC: CUW, SDO, RBO, TPS	• Search for presence of suitable habitat and documentation of all birds observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.

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Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Horned Grebe (*Podiceps auritus*) **Species of Conservation Concern** **Critically Imperilled - S1B,S4N**	• Preferred habitat This species inhabits areas with open water, emergent aquatic vegetation; densely vegetated marshes or shrub-bordered swamps with open water; ponds with emergent shoreline vegetation; marshy inlet and bays of large lakes. Each pair requires at least 1 to 3 ha of breeding territory[14]. • Corresponding ELC: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1	Confirmed breeding for this species only occurs in northwestern Ontario (Cadman, *et al.* 2007) and the individuals observed were certainly migrants, therefore no further assessment is required.
Louisiana Waterthrush *(Seiurus motacilla)* **Species of Conservation Concern, COSEWIC (SC) and MNR Status (SC)**	• Preferred habitat Area sensitive species that inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps. Trees, bushes, exposed roots, cliffs, banks and mossy logs are favoured nesting spots. This species nests on the ground[14.] Riparian woodlands are preferred stopover sites during migration[8]. • Corresponding ELC: FOD, FOM	• Search for contiguous areas of forest of at least 30 ha, with at least 4 ha of interior habitat containing riparian habitat on air photo mosaics within project area. • Search for presence of suitable habitat and documentation of all birds observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Red-headed Woodpecker *(Melanerpes erythrocephalus)* **Species of Conservation Concern, COSEWIC (THR) and MNR Status (SC)**	• Preferred habitat Species inhabits open woodland and woodland edges, especially in oak savannahs and riparian forest[7], open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; requires cavity trees with at least 40 cm dbh; requires about 4 ha for a territory. • Corresponding ELC: FOD, CUW, CUT	• Breeding habitat for this species was partially assessed as Old-growth or Mature Forest Habitat (described above). • Search for presence of suitable habitat and documentation of all birds observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Short Eared Owl *(Asio flammeus)* **Species of Conservation Concern, COSEWIC (SC) and MNR Status (SC)**	• Preferred habitat Species is a ground nester. It requires 75 to 100 ha of contiguous open habitat[14]. The Short-eared Owl makes use of a wide variety of open habitats, including, grasslands, peat bogs, marshes, and old pastures. It also occasionally breeds in agricultural fields. Dense grasslands are preferred nesting sites. The main factor influencing the choice of its local habitat is believed to be the abundance of food, in the form of small rodents[8]. • Corresponding ELC: CUM1, BOO1, MAM2, MAM3	• Seasonal concentration areas for this species were assessed as part of Raptor Winter Feeding and Roosting Areas (described above), and breeding habitat of this species was assessed as part of Open Country Bird Breeding Habitat (described above). • Search for presence of suitable habitat and documentation of all birds observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Yellow-breasted Chat (*Icteria virens)* **Endangered Species, COSEWIC (END) and MNR Status (SC)**	• Preferred habitat Species inhabits thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines, etc.[14]. • Corresponding ELC: CUT1, SWT2, SWT3	• Breeding habitat for this species was assessed as part of Shrub/Early Successional Bird Breeding Habitat (described below). • Search for presence of suitable habitat and documentation of all birds observed during site investigation. Record locations and physical attributes of suitable habitat or species if present.
Azure Bluet *(Enallagma aspersum)* **Species of Conservation Concern** Vulnerable – S3	• Preferred habitat Species inhabits fishless ponds, lakes and boggy swamps [24]. • Corresponding ELC: OAO, SA, SWM, SWD	• Search for presence of dry prairie and sand dune areas on air photo mosaics within project area. • Search for presence of dry prairie and sand dune areas and documentation of all butterflies observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Dusted Skipper (*Atrytonospsis hianna)* **Species of Conservation Concern** Critically Imperiled – S1	• Preferred habitat Species is confined to remnants of dry prairie and sand dune areas[15]. • Corresponding ELC: TPO, TPS, SDO	• Search for presence of dry prairie and sand dune areas on air photo mosaics within project area. • Search for presence of dry prairie and sand dune areas and documentation of all butterflies observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.

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Monarch Butterfly (*Danaus plexippus*) **Species of Conservation Concern, COSEWIC (SC) and MNR Status (SC)**	• Preferred Habitat Monarchs typically occur in open field habitat where the adults forage on a wide range of flowers. The adults are very mobile and may be seen moving through almost any kind of habitat. Their larvae only feed on milkweeds (*Asclepius* spp.). Habitat includes abandoned farmland, along roadsides, and other open spaces where these plants grow[8]. Monarchs migrating south in the fall build up in large concentrations along the north shores of Lake Ontario and Lake Erie. • Corresponding ELC: CUM1, CUT1, CUW1	• According to MNR criteria, Monarch Migratory Stopover Areas are not associated with the study area and were therefore not assessed during the site investigation. • Monarch Feeding and Breeding Habitats were assessed as follows: o Search for presence of suitable feeding and breeding habitat (old fields with an abundance of milkweed) and documentation of all butterflies observed during site investigation. o Record locations and physical attributes of suitable habitat or species if present.
Mottled Duskywing *(Erynnis martialis)* **Species of Conservation Concern** Imperiled – S2	• Preferred habitat Usually seen nectaring or on wet sandy roads with of other species of Erynnis [15]. • Corresponding ELC: Any habitat with any suitable nectaring habitat	• Search for presence of suitable habitat and documentation of all butterflies observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Sleepy Duskywing *(Erynnis brizo)* **Species of Conservation Concern** Critically Imperiled – S1	• Preferred Habitat Species occurs in oak or oak-pine scrub, chaparral, barrens; on well-drained sandy or shaly soils[16]. This species is regularly seen at flowers in oak woods, on the ground, and at mud puddles[15]. • Corresponding ELC: TPS, TPW	• Search for presence of suitable habitat and documentation of all butterflies observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present. • Last known occurrence for this species in area 1985 [2].
Tawny Emperor *(Asterocampa clyton)* **Species of Conservation Concern**	• Preferred habitat Species inhabits densely wooded riparian areas, dry woods, open woods, fencerows and parks where its main host plants Common Hackberry (*Celtis occidentalis*) and Dwarf Hackberry (*Celtis tenuifolia*) are found [15, 35]. • Corresponding ELC: Suitable habitat where its host plants are located.	• Search for presence of suitable habitat and documentation of all butterflies observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
West Virginia White (*Pieris virginiensis)* **Species of Conservation Concern, MNR Status (SC)**	• Preferred Habitat This species is restricted to rich, moist, deciduous woods, where its foodplant Toothwort occurs[7]. • Corresponding ELC: FOD5	• Search for presence of suitable habitat and documentation of all butterflies observed during site investigation. • Search for presence of Toothwort where suitable ecosites encountered during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Eastern Ribbonsnake *(Thamnophis sauritus)* **Species of Conservation Concern, COSEWIC (SC) and MNR Status (SC)**	• Preferred Habitat Occurs in wet meadows, marshes or sphagnum bogs, usually near water such as ponds, or streams. Species hibernates in groups[14]. • Corresponding ELC: MAM2, MAM3, BO	• Seasonal concentration areas for this species were assessed as part of Reptile Hibernacula (described above). • Search for presence of suitable habitat and documentation of all insects observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Milksnake *(Lampropeltis triangulum)* **Species of Conservation Concern, COSEWIC (SC) and MNR Status (SC)**	• Preferred Habitat Species inhabits abandoned farmlands, meadows, thickets and woodlands. Often found hiding under stones, or under boards[14]. • Corresponding ELC: CUM1, CUT1, MAM2, FOM, FOD	• Seasonal concentration areas for this species were assessed as part of Reptile Hibernacula (described above). • Search for presence of suitable habitat and documentation of all insects observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.
Snapping Turtle *(Chelydra serpentine)* **Species of Conservation Concern, COSEWIC (SC) and MNR Status (SC)**	• Preferred Habitat Requires permanent, semi-permanent fresh water, including marshes, swamps, rivers and streams. Nests in open habitats on south-facing slopes. Hibernates in mud under water[14]. • Corresponding ELC:MAM2, MAM3, MAS2, MAS3, SWD, OAO, SAS, SAM, SAF	• Specialized habitats for this species were assessed as part of Turtle Nesting Habitat and Turtle Over-wintering Habitat (described above). • Search for presence of suitable habitat and documentation of all insects observed during site investigation. • Record locations and physical attributes of suitable habitat or species if present.

Table 3.2 Summary of the Criteria and Methods Used to Identify Each Type of Candidate Significant Wildlife Habitat

Type of Candidate Significant Wildlife Habitat	Characteristics of the SWH Type[1] *(All characteristics must be met by candidate SWH)*	Methods of Assessment
Little Brown Bat *(Myotis lucifugus)* **Species of Conservation Concern, COSEWIC (END)**	• Preferred habitat : This species uses caves, quarries, tunnels, hollow trees or buildings for roosting. Often forages near wetlands and forest edges. Overwinters in humid caves. Maternity sites are found in dark warm areas such attics and barns[14]. • Corresponding ELC: CCR1, CCR2, CCA1, CCA2, FOC, FOM, FOD	• Search for presence of mature forest communities especially if near wetland on air photo mosaics within project area. • Search for presence of large hollow trees that could provide roosting sites where suitable ecosites encountered during site investigation. • Record location and physical attributes of suitable habitat or species if present.
Shrub/Early Successional Bird Breeding Habitat	• Presence of the following Ecosites: CUT1, CUS1; and • Shrublands or successional fields greater than 30 ha in size, excluding Class 2 agricultural lands and lands actively used for farming (i.e., no row-cropping in the last 5 years).	• Search for presence of large shrublands or early successional fields on air photo mosaics within project area. • Search for presence of large shrublands or early successional fields during site investigation. • Record location and physical attributes of any potentially qualifying features.
Terrestrial Crayfish	• Presence of all Ecosites associated with the following ELC Community Series: MAM and MAS; and • Entrances of terrestrial crayfish burrows, which are conspicuous tall “chimneys” constructed from pellets of excavated mud.	• Search for presence of large meadow marsh and shallow marsh communities on air photo mosaics within project area. • Search for entrances of burrows (“chimneys”) where suitable ecosites encountered during site investigation. • Record location and physical attributes of any potentially qualifying features.
Animal Movement Corridor		
Amphibian Corridors	• Habitat is not ELC specific; and Corridors must be determined only when amphibian breeding habitat is confirmed as SWH.	• Search for candidate Amphibian Woodland Breeding Habitat and candidate Amphibian Wetland Breeding Habitat as described above. • Search for possible amphibian movement corridors associated with the above habitats during site investigation. • Record location and physical attributes of any potentially qualifying features.

Notes:
1. *Illinois Wildflowers, n.d. Available: www.illinoiswildflowers.info*
2. *MNR Biodiversity Explorer, 2012. Available: https://www.biodiversityexplorer.mnr.gov.on.ca*
3. *The University of Texas at Austin – Wildflower Centre, n.d. Available: www.wildflower.org*
4. *Ontario Wildflowers, 2012. Available: www.ontariowildflowers.com*
5. *United States Department of Agriculture – Natural Resources Conservation Service, 2012. Available: http://plants.usda.gov/java/charProfile?symbol=BICO*
6. *Voss, E.G., 1996. Michigan Flora, Volume 3: Dicots Concluded. Cranbrook Institute of Science Bulletin 61 & University of Michigan Herbarium. xii + pp. 622.*
7. *Royal Ontario Museum, n.d. Available: http://www.rom.on.ca/ontario/risk.php*
8. *Species at Risk Public Registry, 2012. Available: http://www.registrelep-sararegistry.gc.ca/*
9. *Montana Plant Life, n.d. Available: http://montana.plant-life.org/species/vale_edul.htm*
10. *Wikipedia, 2011. Available: http://en.wikipedia.org/wiki/Blephilia_hirsuta*
11. *eFloras.og, n.d. Available: http://www.efloras.org*
12. *Missouri Botanical Garden, n.d. Available: http://www.missouribotanicalgarden.org/gardens-gardening/your-garden/plant-finder/plant-details/kc/a649/saururus-cernuus.aspx*
13. *Reznicek, A.A., Voss, E.G. and Walters, B.S., 2011. Michigan Flora Online. University of Michigan. Available: http://michiganflora.net/species.aspx?id=251*
14. *MNR, 2000. Significant Wildlife Habitat Technical Guide, Appendix G.*
15. *Canadian Biodiversity Information Facility, 2010. Available: http://www.cbif.gc.ca/spp_pages/butterflies/species/MottledDuskywing_e.php*
16. *Butterflies and Moths of North America, n.d. Available: http://www.butterfliesandmoths.org/species/Asterocampa-clyton*
17. *Paulson, D., 2009. Dragonflies and Damselflies of the West. Princeton University Press. Available: http://books.google.ca/books?id=wnX1nJSmFfAC&pg=PA176&lpg=PA176&dq=ontario+dusky+dancer+habitat&source=bl&ots=wB8KW-fBZB&sig=YsH7mreaXFD_8Lnz6fDWotijdLc&hl=en&sa=X&ei=aHeET7avOobn0QHkheW-Bw&ved=0CC0Q6AEwAQ#v=onepage&q=ontario%20dusky%20dancer%20habitat&f=false*
18. *Mohlenbrock, R.H., 1999. Sedges:Carex. Southern Illinois University. Available: http://books.google.ca/books?id=1ZGekaNQ4YAC&pg=PA247&lpg=PA247&dq=carey’s+sedge+bloom&source=bl&ots=iTsQPehdAa&sig=iOzBzcXy4MYWwBjImewlpTnT5WI&hl=en&sa=X&ei=asmET-C4I4X00gGr1LmxBw&ved=0CCQQ6AEwAA#v=onepage&q=carey’s%20sedge%20bloom&f=false*
19. *State of Montana, n.d., Montana Field Guide. Available: http://fieldguide.mt.gov/detail_IIODO08310.aspx*
20. *Michigan Natural Features Inventory, 2007. Rare Species Explorer. Available:-http://mnfi.anr.msu.edu/explorer/species.cfm?id=11568*
21. *Oldham, M.J. and Brinker, S.R., 2009. Ministry of Natural Resources. Rare Vascular Plants of Ontario, Fourth Ed. Available: http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=15769&Attachment_ID=33301*

3.3 Results of Site Investigations

A total of 85 "natural areas" (refer to Section 3.2 above) were identified within the 120 m Area of Investigation and were visited during the 2011 and 2012 site investigations. The locations of these natural areas are shown on Figure 3.1 (key map) and Figure 3.2a, b and c (Wind Energy Centre Study Area), as well as Figure 3.2d and e (Transmission Line Study Area). The ELC summary by community determined through site investigations is provided in Table 3.3.

3.3.1 Vegetation Communities

All natural areas within the 120 m Area of Investigation were delineated into ELC units (Figure 3.2a, b, c, d and e). Vegetation communities found within the 120 m Area of Investigation can be divided into 13 different community series (e.g., CUM: Cultural Meadow, FOD: Deciduous Forest, SWT: Thicket Swamp etc.). This is the lowest level within the ELC classification that can be identified without site specific surveys. The units are determined based on the type of vegetation cover or plant form that best characterizes the community in question (e.g., open, shrub, treed, deciduous, coniferous, or mixed).

The observed community series designations were further separated into 24 different ecosites (e.g., CUM1: Mineral Cultural Meadow Ecosite, FOD5: Dry-Fresh Sugar Maple Deciduous Forest Ecosite, SWT2: Mineral Thicket Swamp Ecosite, etc.). Ecosites are defined as "*mappable, landscape units integrating a consistent set of environmental factors and vegetation characteristics*" (Lee *et al*., 1998).

Where possible, these ecosites were then classified to vegetation type (e.g., CUM1-1: Dry-Moist Oldfield Meadow Type, FOD5-1: Dry-Fresh Sugar Maple Deciduous Forest Type, and SWT2-5: Red-osier Mineral Thicket Swamp Type) which is the finest level of detail within the ELC classification system. These units are based on specific groupings of plants (Lee *et al*., 1998). The vegetation communities identified within the 120 m Area of Investigation are further described in Table 3.3 below and are summarized to the main ecosites in Table 3.4.

Through ELC surveys it was noted that deciduous forest (FOD) is the most frequent vegetation community series in the 120 m Area of Investigation, claiming a total of 581.9 ha. The Dry-Fresh Sugar Maple Deciduous Forest (FOD5) was the most common Ecosite in the 120 m Area of Investigation, dominating 167.7 ha.

The rarity of each vegetation community identified during sites investigations was determined using Appendices J and M of the *Significant Wildlife Habitat Technical Guide* (SWHTG) (MNR, 2000) and the Natural Heritage Information Centre (MNR, 2011a). One provincially rare community was observed during field investigations within the 120 m Area of Investigation, FOD7-4: Fresh-Moist Black Walnut Lowland Deciduous Forest Type. This community type is ranked S2S3 (imperiled to vulnerable) and was observed immediately east of Goshen Line and north of Huron Street, within natural area 309. The community is approximately 3.3 ha in size. This community was carried forward to the Evaluation of Significance as described in Section 3.3.6.2 below. A full list of vegetation community rankings can be found in Table 3.19.

Incidental wildlife observations recorded during site investigations are included in Table 3.3.

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
177	17.6	12-Jul-11	12-Aug-11 16-Apr-12	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type		17.4	Mid-age to Mature	This mid-age to mature forest has a broken canopy allowing for thick shrub layer growth. Species observed within the canopy include green ash, Freeman's maple, and white elm. The sub-canopy is comprised of white elm, green ash, and hawthorn species The shrub layer is mainly dominated by American prickly ash, nannyberry, common buckthorn, and currant species. The ground cover consists of wild strawberry, dog violet, sedge species, tall agrimony.	**Birds:** Song Sparrow, Canada Goose, Downy Woodpecker, Turkey Vulture, Red-tailed Hawk, Indigo Bunting, White-breasted Nuthatch, Killdeer, Northern Flicker **Lepidoptera:** Monarch, Red-spotted Purple, Giant Swallowtail **Odonata:** Yellow-legged Meadowhawk **Mammals:** White-tailed Deer
189	63.4	13-Jul-11		FOD9-5	Fresh - Moist Bitternut Hickory Deciduous Forest Type		4.1	Mature	The canopy within this mature deciduous forest is dominated by bitternut with equal amounts of shagbark and ironwood. The sub-canopy is dominated by equal amounts of hazelnut and blue beech with some black cherry. The ground layer is dominated by poison ivy with some clearweed and narrow leaf sedge species.	No wildlife observed
		26-Apr-12		FOD9-4	Fresh - Moist Shagbark Hickory Deciduous Forest Type Surveyed from fence line		6.1	Mature	The canopy within this mature forest is dominated by shagbark hickory with fewer American beech, sugar maple and green ash associates. The sub-canopy is mainly sugar maple with some green ash. The shrub layer is dominated by choke cherry. The ground cover consists of yellow trout lily and white trillium.	**Birds:** American Crow, Great Blue Heron, Northern Flicker, American Goldfinch, Wild Turkey, Northern Cardinal **Mammals:** Gray Squirrel
		4-Jul-12		SWD2-2	Green Ash Mineral Deciduous Swamp Type Surveyed from fence line		12.2	Mid-age	The canopy layer within this mid-age swamp consists mainly of green ash with some white elm, shagbark hickory and bitternut hickory associates. The sub-canopy layer consists of white elm with less green ash. The shrub layer consists of white elm, bitternut hickory and green ash. The ground cover consists of green ash, moneywort and poison ivy.	No wildlife observed
		7-Nov-11	23-Apr-12	FOD7d	Fresh - Moist White Elm - Ash - Hawthorn Deciduous Forest Type Surveyed from fence line		22.7	Young to Mid-age	Species observed within this young to mid-age forest include white elm, green ash, and basswood, while the sub-canopy layer consists mainly of hawthorn with some common apple. The herbaceous layer consists of a mixture of white avens, Canada blue grass, garlic mustard, and graceful sedge. This community is a successional forest/thicket occurring on moist level ground.	**Birds:** Turkey Vulture **Mammals:** Raccoon
		12-Jul-11	12-Aug-11 29-Nov-11 17-Apr-12	FOD6-5	Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type		6.5	Mid-age	The canopy layer within this mid-age to mature deciduous forest is dominated by sugar maple, basswood, shagbark hickory, and ironwood. The ground cover layer is comprised of herb robert, spotted geranium, and false solomon's seal.	**Birds:** Woodpecker Species., Red-tailed Hawk, Black-billed Cuckoo, Song Sparrow, Eastern Wood-pewee, American Crow, Black-capped Chickadee **Lepidoptera:** Giant Swallowtail **Mammals:** White-tailed Deer **Crustaceans:** Chimney Crayfish
190	5.4	14-Oct-11		FOD5-8	Dry - Fresh Sugar Maple - White Ash Deciduous Forest Type Surveyed from roadside		0.8	Mid-age	This mid-age community is located on a small valley slope. Canopy species within this dry-fresh deciduous forest include white ash and sugar maple while the sub-canopy is dominated mainly by sugar maple with some white ash. The shrub layer consists of equal amounts of grey dogwood and sugar maple.	No wildlife observed
		14-Oct-11		CUW1m	Green Ash - Hawthorn Mineral Cultural Woodland Type Surveyed from roadside		4.5	Mid-age	The canopy of this mid-age cultural woodland is dominated by green ash with hawthorn and common apple found throughout. The ground cover is comprised mainly of garlic mustard with lesser amounts of poison ivy.	No wildlife observed
198	9.9	17-May-12		CUM1-1	Dry - Moist Old Field Meadow Type		1.2	Young	There is no canopy layer within this young meadow. The sub-canopy consists of white elm. The shrub layer consists of red-osier dogwood. The ground cover is mainly Kentucky bluegrass with lesser amounts of orchard grass.	**Birds:** Turkey Vulture, Song Sparrow, American Crow, House Wren, American Goldfinch, Yellow Warbler, Downy Woodpecker, Horned Lark, Red-winged Blackbird, American Robin, Savannah Sparrow, Killdeer **Mammals:** White-tailed Deer **Lepidoptera:** Monarch

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
		7-Nov-11	17-Apr-12 17-May-12	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type	OAO: Open Aquatic CUT1h: Green Ash Mineral Cultural Thicket Type	3.3	Young to Mid-age	The canopy within this young to mid-age forest is dominated by green ash with fewer Freeman's maple. The sub-canopy consists of Manitoba maple. The shrub layer is mainly comprised of a hawthorn species with fewer red-osier dogwood and willows. The ground cover is mainly smooth brome grass with fewer garlic mustard and less wild madder. The small young thicket inclusion is succeeding into a green ash forest. Dominant species observed include green ash, white elm, and hawthorn. Other species observed include Kentucky bluegrass, Canada goldenrod, aster species, and wild carrot.	**Birds:** Turkey Vulture, Song Sparrow, American Crow, House Wren, American Goldfinch, Yellow Warbler, Downy Woodpecker, American Robin **Mammals:** White-tailed Deer **Lepidoptera:** Monarch
203	41.5	30-Apr-12		FOD9-3	Fresh - Moist Bur Oak Deciduous Forest Type		3.6	Mid-age	The canopy layer of this mid-age forest is dominated by bur oak with some shagbark hickory and less green ash and white elm associates. The sub-canopy layer consists mainly of white elm with fewer green ash and less ironwood. Species within the shrub layer are mainly bitternut hickory with fewer choke cherry. The ground cover consists of spotted geranium with some yellow trout lily and less violet species and sedge species.	**Birds:** Killdeer, Red-winged Blackbird
204	4.9	23-Apr-12		CUM1-1	Dry - Moist Old Field Meadow Type		0.1	Pioneer to Young	This is a pioneer to young meadow community with some small pockets of trees and shrubs. The canopy layer consists of sugar maple, eastern white pine, and Norway spruce. There is no sub-canopy layer. Species within the shrub layer are mainly eastern white cedar with less common apple. The ground cover consists of smooth brome with less orchard grass.	**Birds:** Turkey Vulture
206	11.2	8-Sep-11		CUW1c	Green Ash - Apple - Hawthorn Mineral Cultural Woodland Type		4.2	Mid-age	The canopy layer of this mid-age deciduous forest is dominated by green ash, apple, cockspur thorn. The shrub layer consists of staghorn sumac and grey dogwood. The ground cover layer consists of Canada goldenrod and tall goldenrod, with some tall white aster and New England aster.	**Birds:** Red-tailed Hawk, Great Blue Heron (fly-by) **Herpetofauna:** Wood Frog, American Toad
		20-Jul-11		FOD9-4	Fresh - Moist Shagbark Hickory Deciduous Forest Type		7.0	Mature	The canopy layer of this mature deciduous forest is dominated by shagbark hickory, green ash, bur oak and bitternut hickory. The sub-canopy layer consists of shagbark hickory and green ash, and the shrub layer is dominated by green ash. The ground cover layer consists of spotted geranium, green ash and running strawberry bush.	No wildlife observed
209	14.9	1-May-12		FOD9e	Fresh - Moist Shagbark Hickory - Sugar Maple - American Beech - Blue Beech Deciduous Forest Type	SWT2: Mineral Thicket Swamp Ecosite FOD2-1: Dry - Fresh Oak - Red Maple Deciduous Forest Type FOD8-1: Fresh - Moist Poplar Deciduous Forest Type CUP3d: White Pine - Red Pine - Scots Pine - Balsam Fir Coniferous Plantation Type	4.6	Mid-age	The canopy layer of this mid-age forest consists of shagbark hickory, sugar maple, American beech and red maple. The sub-canopy consists of American beech and blue beech. Species within the shrub layer are mainly spicebush with fewer blue beech, gray dogwood, and choke cherry associates. The ground cover consists of yellow trout lily, spotted geranium, jack-in-the-pulpit, and false solomon's seal. The thicket swamp is dominated by spice bush. The canopy layer of the plantation inclusion consists of eastern white pine, red pine, scots pine, and balsam fir. The sub-canopy is dominated by green ash. The shrub layer is dominated by choke cherry. The ground cover consists of Virginia strawberry, spotted geranium, buttercup species, and avens species.	**Birds:** Red-winged Blackbird, Black-capped Chickadee, Song Sparrow, Northern Flicker, Blue Jay, Canada Goose, White-throated Sparrow, Chipping Sparrow, American Crow, Northern Cardinal **Mammals:** White-tailed Deer
		1-May-12	4-Jul-12	CUP3-2	White Pine Coniferous Plantation Type	OAO: Open Aquatic CUP2b: White Pine - White Ash - Trembling Aspen Mixed Plantation Type CUT1: Mineral Cultural Thicket Ecosite CUM1-1: Dry - Moist Old Field Meadow Type	9.3	Mid-age	The canopy layer of this mid-age forest is dominated by eastern white pine. The sub-canopy layer consists of eastern white pine and green ash. The shrub layer is dominated by choke cherry. The ground cover consists of wild strawberry, spotted geranium, and avens species. In the plantation inclusion, the canopy layer consists mainly of eastern white pine with fewer amounts of white ash and trembling aspen. The sub-canopy consists mainly of eastern white pine with fewer amounts of white ash and trembling aspen. The shrub layer consists of choke cherry and tartarian honeysuckle. The ground cover consists of giant goldenrod, choke cherry and thimbleweed.	**Birds:** Red-winged Blackbird, Black-capped Chickadee, Song Sparrow, Northern Flicker, Blue Jay, Canada Goose, White-throated Sparrow, Chipping Sparrow, American Crow, Northern Cardinal **Mammals:** White-tailed Deer

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
210	43.9	1-May-12		CUM1-1	Dry - Moist Old Field Meadow Type		0.5	Mid-age	The canopy layer within the mid-age meadow consists of Manitoba maple and black walnut. There is no sub-canopy or shrub layer. The ground cover consists of reed canary grass, garlic mustard, common dandelion, and goldenrod species.	**Birds:** Black-capped Chickadee, Downy Woodpecker, House Wren, Red-eyed Vireo, Indigo Bunting **Mammals:** Raccoon, White-tailed Deer
		1-May-12		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type		0.6	Young to Mid-age	The canopy within this young to mid-age forest consists of green ash, Manitoba maple and white elm. The sub-canopy consists of a hawthorn species, green ash, and Manitoba maple. The ground cover consists of common dandelion, garlic mustard, Manitoba maple and wild strawberry.	**Birds:** Eastern Phoebe, American Goldfinch, Killdeer, Vesper Sparrow, Horned Lark **Lepidoptera:** Red Admiral **Mammals:** White-tailed Deer
		1-May-12		CUT1i	Green Ash - Manitoba Maple Mineral Cultural Thicket Type		1.6	Mid-age	The canopy layer within this mid-age thicket consists of green ash and Manitoba maple. There is no sub-canopy. The shrub layer consists of English hawthorn, common apple, and common buckthorn. The ground cover consists of garlic mustard and bedstraw species.	**Birds:** Black-capped Chickadee, Downy Woodpecker, House Wren, Red-eyed Vireo, Indigo Bunting **Mammals:** Raccoon, White-tailed Deer
		11-Aug-11		FOD4-2	Dry - Fresh White Ash Deciduous Forest Type		4.7	Mid-age	The canopy layer within this mid-age deciduous forest is dominated by white ash and white elm with lesser amounts of sugar maple, while the sub-canopy consists of hawthorn, white ash, and choke cherry. The shrub layer consists of yellow avens, red currant, may apple and tall buttercup, and the herbaceous layer consists of poison ivy, thicket creeper, and running strawberry bush.	**Birds:** Black-capped Chickadee, Downy Woodpecker, House Wren, Red-eyed Vireo, Indigo Bunting **Mammals:** Raccoon, White-tailed Deer
		11-Aug-11	7-Nov-2011 1-May-2012	FOD7-1	Fresh - Moist White Elm Lowland Deciduous Forest Type		5.8	Mature	The canopy layer of this mature deciduous forest is dominated by Freeman's maple with lesser amounts of white elm, white ash and black walnut. Species observed within the sub canopy include white ash, hawthorn, and prickly ash. Species observed within the shrub layer include black raspberry, and prickly-ash. The herbaceous layer consists of garlic mustard, wood nettle, poison ivy, thicket creeper, and yellow avens.	**Birds:** American Goldfinch, Killdeer, Vesper Sparrow, Horned Lark, Eastern Phoebe, American Robin, Downy Woodpecker, Black-capped Chickadee, Black-billed Cuckoo **Lepidoptera:** Red Admiral
215	13.3	4-Oct-11		SWD3-3	Swamp Maple Mineral Deciduous Swamp Type		1.7	Mature	The canopy within this mature deciduous swamp is dominated by freeman's maple with lesser amounts of green ash. The sub-canopy is dominated by Freeman's maple with lesser amounts of green ash. Species present in the ground layer include a variable mix of sensitive fern, false nettle, lady fern, fowl manna grass, woodland strawberry, northern dewberry and bladder sedge.	**Birds:** Wild Turkey, American Crow, Blue Jay **Mammals:** White-tailed Deer
		4-Oct-11	8-Nov-11	FOD4f	Dry - Fresh White Ash - Basswood Deciduous Forest Type Surveyed from fence line	CUM1-1: Dry - Moist Old Field Meadow Type	3.6	Mid-age	Dominant species observed within the canopy of this mid-age deciduous forest include white ash, basswood, and lesser amounts of white elm. The sub-canopy is dominated by basswood with equal amounts of bitternut hickory, and sugar maple. The shrub layer consists of choke cherry, white ash and basswood, and the herbaceous layer is comprised of poison ivy, white avens, and calico aster.	**Birds:** Blue Jay, American Goldfinch, Downy Woodpecker **Herpetofauna:** Spring Peeper **Mammals:** Gray Squirrel
		4-Oct-11	8-Nov-11	FOD6-5	Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type		6.1	Mature	The canopy layer of this mature deciduous forest is dominated by basswood with equal amounts of sugar maple, beech and shagbark hickory. The sub-canopy consists of blue beech with equal amounts of sugar maple and American beech and some choke cherry. The shrub layer consists of prickly gooseberry and black raspberry, and the herbaceous layer contains running strawberry bush, false solomon's seal, yellow avens and Virginia waterleaf.	**Birds:** Wild Turkey, American Crow, Blue Jay, American Goldfinch, Downy Woodpecker **Herpetofauna:** Spring Peeper **Mammals:** White-tailed Deer, Gray Squirrel
216	23.9	7-Sep-11		CUW1d	Black Walnut Mineral Cultural Woodland Type		0.5	Mid-age	The canopy layer in this mid-age cultural woodland is dominated by black walnut, white ash and white pine.	**Herpetofauna:** Wood Frog **Mammals:** White-tailed Deer **Odonata:** Common Green Darner
		7-Sep-11		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type		2.3	Mid-age	The canopy layer of this mid-age deciduous forest is dominated by green ash and white ash. The sub-canopy layer consists of green ash, pin cherry and staghorn sumac. The shrub layer is dominated by grey dogwood. The ground cover layer is mainly comprised of giant ragweed, Canada goldenrod and alternate-leaved dogwood.	**Herpetofauna:** Wood Frog **Mammals:** White-tailed Deer **Odonata:** Common Green Darner

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
		7-Sep-11	13-Dec-11	FOD9-2	Fresh - Moist Oak - Maple Deciduous Forest Type	SWT2: Mineral Thicket Swamp Ecosite CUM1-1: Dry - Moist Old Field Meadow Type	13.2	Mature	The canopy layer of this mature deciduous forest consists of bur oak, shagbark hickory and green ash. The sub-canopy consists of equal amounts of bur oak and shagbark hickory with lesser amounts of green ash and white elm. The shrub layer consists of bitternut hickory and basswood with equal amounts of green ash and bur oak, while the herbaceous layer consists of graceful sedge, avens species and choke cherry.	**Birds:** Wild Turkey, Gray Catbird, White-breasted Nuthatch, Tundra or Trumpeter Swan (fly over) **Lepidoptera:** Monarch **Mammals:** Eastern Cottontail, White-tailed Deer
217	1.3	30-Apr-12		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type		1.2	Mid-age	The canopy layer of this mid-age forest is dominated by green ash with fewer white elm, ironwood and basswood. The sub-canopy is mainly hawthorn species with fewer red maple and less white elm. Species within the shrub layer consist mainly of choke cherry with fewer red maple. The ground cover consists of yellow trout lily, white trillium, garlic mustard and spotted geranium.	**Birds:** Red-winged Blackbird, Downy Woodpecker **Mammals:** Coyote, Red Fox
220	1.1	26-Apr-12	18-May-12	CUM1-1	Dry - Moist Old Field Meadow Type Surveyed from roadside		1.1	Pioneer	The canopy layer within this pioneer meadow consists of Norway spruce and red pine. There is no sub-canopy or shrub layer. The ground cover consists mainly of smooth brome grass with some reed canary grass.	**Birds:** Turkey Vulture, American Crow, American Robin, Red-winged Blackbird
225	3.7	9-Nov-11	17-Apr-12	FOD9d	Fresh - Moist Shagbark Hickory - Green Ash Deciduous Forest Type		0.8	Mid-age	Canopy species recorded in this mid-age deciduous forest include equal amounts of shagbark hickory, and green ash while sub-canopy species include equal amounts of sugar maple, hawthorn, white elm and green ash. The herbaceous layer includes running strawberry bush, sedge species and white avens.	**Birds:** Black-capped Chickadee, Mourning Dove, Eastern Phoebe, Song Sparrow, Red-winged Blackbird, Yellow-bellied Sapsucker, Red-tailed Hawk, Northern Flicker **Crustaceans:** Chimney Crayfish
		13-Jul-11	9-Nov-11 17-Apr-12	SWD2-2	Green Ash Mineral Deciduous Swamp Type	MAM2-2: Reed-canary Grass Mineral Meadow Marsh Type	1.6	Mid-age	The canopy layer of this mid-age deciduous swamp is dominated by green ash.	**Birds:** Black-capped Chickadee, Mourning Dove, Eastern Phoebe, Song Sparrow, Red-winged Blackbird, Yellow-bellied Sapsucker, Red-tailed Hawk, Northern Flicker **Crustaceans:** Chimney Crayfish
227	28.9	18-May-12		CUM1-1	Dry - Moist Old Field Meadow Type		4.9	Young	The canopy layer of this young meadow is mainly basswood with less sugar maple and green ash. The sub-canopy layer is mainly black walnut with less white spruce. The shrub layer is mainly red-osier dogwood and nannyberry. The ground cover consists mainly of Kentucky bluegrass with fewer orchard grass and less reed canary grass.	**Birds:** Red-winged Blackbird, Song Sparrow, Brown Thrasher, Eastern Kingbird, American Goldfinch, Warbling Vireo, Turkey Vulture, Brown-headed Cowbird, American Robin, Willow Flycatcher, Tree Swallow, Horned Lark, Yellow-bellied Sapsucker, Blue Jay **Lepidoptera:** Cabbage White
229	4.3	20-Jul-11	13-Oct-11 9-Nov-11 24-Apr-12	FOD5-6	Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type Surveyed from fence line	FOD4b: Dry - Fresh Basswood - White Elm - Bitternut Hickory - White Ash Deciduous Forest Type	4.3	Mature	The canopy of this mature deciduous forest consists of equal amounts of sugar maple and basswood with lesser amounts of white ash and American beech. The sub-canopy consists of sugar maple, ironwood and American beech. The shrub layer consists of sugar maple with some choke cherry, while the herbaceous layer consists of white avens, zigzag goldenrod and calico aster. The inclusion is a hedgerow wherein the canopy layer is dominated by basswood with equal amounts of white elm, bitternut hickory, and white ash. The sub-canopy consists of grey dogwood, white elm and common apple. Species observed within the shrub layer include red raspberry, and the herbaceous layer includes garlic mustard, white avens and tall white aster.	**Birds:** Song Sparrow, American Goldfinch, American Robin, Red-winged Blackbird, Brown-headed Cowbird, American Pipit, American Goldfinch, Northern Flicker, Blue Jay, White-crowned Sparrow **Lepidoptera:** Monarch **Mammals:** Coyote
232	118.0	14-Oct-11	8-Nov-11	FOD4c	Dry - Fresh White Ash - Paper Birch Deciduous Forest Type	FOD5-1: Dry - Fresh Sugar Maple Deciduous Forest Type FOM6-1: Fresh - Moist Sugar Maple - Hemlock Mixed Forest Type FOD4-2: Dry - Fresh White Cedar - Poplar Deciduous Forest Type	1.2	Mid-age	Species observed within the canopy of this mid-age deciduous forest include white ash, paper birch, sugar maple, and basswood. The sub-canopy consists of equal amounts of basswood and sugar maple. The shrub layer is dominated by sugar maple, spicebush, and blackberry while dominant species in the herbaceous layer include running strawberry bush and violet species.	**Birds:** Red-tailed Hawk, American Crow, White-throated Sparrow, White-crowned Sparrow, Blue Jay, Hairy Woodpecker, Song Sparrow, White-breasted Nuthatch, Mourning Dove **Mammals:** Eastern Chipmunk, Raccoon

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
		15-Sep-11		CUP3-2	White Pine Coniferous Plantation Type		1.3	Mid-age to mature	The canopy and sub-canopy of this mid-age to mature coniferous plantation is dominated by white pine with some deciduous regeneration including white ash and sugar maple. Species observed within the shrub layer include white ash and sugar maple. The herbaceous layer consists of poison ivy, herb-robert, garlic mustard and calico aster.	**Birds:** Red-tailed Hawk, American Crow, White-throated Sparrow, White-crowned Sparrow, Blue Jay, Hairy Woodpecker, Song Sparrow, White-breasted Nuthatch, Mourning Dove, Black-capped Chickadee **Mammals:** Eastern Chipmunk, Raccoon
		15-Sep-11		FOD3-1	Dry - Fresh Poplar Deciduous Forest Type Surveyed from fence line		1.8	Mid-age	Dominant species within the canopy of this mid-age deciduous forest include white ash, trembling aspen, cottonwood and sugar maple. The sub-canopy consists of hawthorn, white ash, witch hazel and blue beech. The sparse shrub layer contains black currant, while the herbaceous layer consists of running strawberry bush, Canada may flower, fowl manna grass and jack-in-the-pulpit.	**Birds:** White-breasted Nuthatch, Black-capped Chickadee
		14-Oct-11		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type	SWD3-3: Swamp Maple Mineral Deciduous Swamp Type	3.4	Mid-age	The canopy of this mid-age deciduous forest is dominated by green ash with lesser amounts of basswood and white elm, while the sub-canopy consists of sugar maple and blue beech. Dominant species observed within the shrub layer are multiflora rose, grey dogwood, immature sugar maple, and red raspberry. The herbaceous layer includes species such as white avens, herb robert, running strawberry bush, Virginia strawberry and graceful sedge. The community had evidence of selective logging and was somewhat disturbed. A Swamp Maple Deciduous Swamp (SWD3-3) inclusion was found within the community as well as a drainage ditch.	**Birds:** Red-tailed Hawk, American Crow, White-throated Sparrow, White-crowned Sparrow, Blue Jay, Hairy Woodpecker, Song Sparrow, White-breasted Nuthatch, Mourning Dove **Mammals:** Eastern Chipmunk, Raccoon
		14-Oct-11		FOD5-8	Dry - Fresh Sugar Maple - White Ash Deciduous Forest Type		7.9	Mid-age	The canopy species of this mid-age deciduous forest include white ash and sugar maple with some paper birch. The sub-canopy is dominated by sugar maple. Shrub layer species observed include spicebush, black cherry and sugar maple, while the herbaceous layer consists of running strawberry bush and creeping partridge berry.	**Birds:** Red-tailed Hawk, American Crow, White-throated Sparrow, White-crowned Sparrow, Blue Jay, Hairy Woodpecker, Song Sparrow, White-breasted Nuthatch, Mourning Dove **Mammals:** Eastern Chipmunk, Raccoon
		25-Apr-12		FOD5-5	Dry - Fresh Sugar Maple - Hickory Deciduous Forest Type Surveyed from fence line		4.1	Mid-age	The canopy within this mid-age forest is mainly shagbark hickory with fewer sugar maple. The sub-canopy layer is dominated by sugar maple. Species within the shrub layer consist of nannyberry and choke cherry. The ground cover consists of running strawberry bush with fewer yellow trout lily.	**Birds:** Northern Flicker, Red-winged Blackbird, Downy Woodpecker, Red-bellied Woodpecker, Wood Thrush **Lepidoptera:** Cabbage White, Red Admiral **Herpetofauna:** Eastern Garter Snake
235	1.6	7-Nov-11	19-Apr-12	FOD9c	Fresh - Moist Bitternut Hickory - Basswood Deciduous Forest Type		0.8	Mid-age	This is a small mid-age woodland with evidence of edge effects. Dominant species observed within the canopy of this mid-age deciduous forest include basswood, bitternut hickory and equal amounts of white elm and green ash. The sub-canopy species include equal amounts of white elm and ironwood. Species observed within the herbaceous layer include poison ivy, tall white aster and some zigzag goldenrod.	**Birds:** American Crow, Red-winged Blackbird, Brown-headed Cowbird, White-breasted Nuthatch, Downy Woodpecker, Northern Flicker, Mallard, Song Sparrow **Mammals:** White-tailed Deer **Herpetofauna:** Spring Peeper **Lepidoptera:** Clouded Sulphur, Orange Sulphur, Red Admiral, Cabbage White, Eastern Comma, **Odonates:** Common Green Darner
		7-Nov-11	19-Apr-12	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type		0.7	Mid-age	This mid-age community is located in the southern portion of the feature and is dominated by freeman's maple with some green ash. There is evidence of seasonal flooding, likely brief in duration.	**Birds:** American Crow, Red-winged Blackbird, Brown-headed Cowbird, White-breasted Nuthatch, Downy Woodpecker, Northern Flicker, Mallard, Song Sparrow **Mammals:** White-tailed Deer **Herpetofauna:** Spring Peeper **Lepidoptera:** Clouded Sulphur, Orange Sulphur, Red Admiral, Cabbage White, Eastern Comma, **Odonates:** Common Green Darner
236	30.6	13-Oct-11	18-Apr-12 4-July-12	FOM6-2	Fresh - Moist Hemlock - Hardwood Mixed Deciduous Forest Type		0.6	Mid-age	The canopy layer within this mid-age forest consists of Basswood, White Ash, Shagbark Hickory and Red Oak. The sub-canopy layer consists of Ironwood, Sugar Maple and Bitternut Hickory. The shrub layer consists mainly of Blue Beech with less Bitternut Hickory, Shagbark Hickory and Sugar Maple. The ground cover consists of Spotted Geranium, Virginia Strawberry, Poison Ivy and Running Strawberry Bush.	**Birds:** Red-eyed Vireo, Eastern Wood-pewee, White-breasted Nuthatch

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
		13-Oct-11	18-Apr-12	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type (north of Turbine 36)		0.6	Mid-age	This mid-age swamp community is dominated by freeman's maple.	**Birds:** Black-capped Chickadee, Song Sparrow, American Robin, Red-bellied Woodpecker, Blue Jay, Northern Flicker, White-crowned Sparrow, Swamp Sparrow, American Crow, Killdeer **Herpetofauna:** Spring Peeper, Green Frog, Eastern Newt **Mammals:** White-tailed Deer
		9-Nov-11	18-Apr-12 19-Apr-12	FOD9b	Fresh - Moist Shagbark Hickory - White Ash - Beech Deciduous Forest Type (east of Turbine 37)		0.9	Mid-age	The canopy of this mid-age forest community is dominated by white ash and shagbark hickory with lesser amounts of white ash, red oak and American beech. The sub-canopy consists of ironwood and sugar maple.	**Birds:** Song Sparrow, American Crow, Blue Jay, Black-capped Chickadee, Downy Woodpecker, American Goldfinch, Snow Bunting, Rusty Blackbird, Red-winged Blackbird, American Tree Sparrow, Dark-eyed Junco, White-breasted Nuthatch, Turkey Vulture, Belted Kingfisher, Northern Flicker, Blue Jay **Mammals:** White-tailed Deer, Gray Squirrel, Eastern Cottontail **Lepidoptera:** Red Admiral, Cabbage White, Grey Comma **Herpetofauna:** Spring Peeper
		9-Nov-11	18-Apr-12 19-Apr-12	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type		1.2	Mid-age	This mid-age deciduous forest is dominated by green ash.	**Birds:** White-breasted Nuthatch, Turkey Vulture, Downy Woodpecker, Black-capped Chickadee, Belted Kingfisher, Northern Flicker, Blue Jay **Mammals:** White-tailed Deer, Gray Squirrel **Lepidoptera:** Red Admiral, Cabbage White, Grey Comma
		9-Nov-11	18-Apr-12 19-Apr-12	FOD9b	Fresh - Moist Shagbark Hickory - White Ash - Beech Deciduous Forest Type (northeast of Turbine 37)	SWD2-2: Green Ash Mineral Deciduous Swamp Type	1.5	Mid-age	The canopy within this mid-age forest consists of shagbark hickory, bur oak, and white ash. The sub-canopy consists of sugar maple and white elm. The ground cover consists of sedge species and white avens.	**Birds:** White-breasted Nuthatch, Turkey Vulture, Downy Woodpecker, Black-capped Chickadee, Belted Kingfisher, Northern Flicker, Blue Jay **Mammals:** White-tailed Deer, Gray Squirrel **Lepidoptera:** Red Admiral, Cabbage White, Grey Comma
		13-Oct-11	18-Apr-12	FOD4-2	Dry - Fresh White Ash Deciduous Forest Type		1.7	Mid-age to mature	This mid-age to mature deciduous forest community is dominated by white ash with small amounts of American beech, sugar maple and ironwood. The sub-canopy contains equal amounts of sugar maple and ironwood. The shrub layer consist of American beech and ironwood while the ground cover is dominated by Canada goldenrod, radiate sedge, zig zag goldenrod and white avens.	**Birds:** Black-capped Chickadee, American Robin, Red-bellied Woodpecker, Northern Flicker, White-crowned Sparrow, Swamp Sparrow, American Crow, Killdeer, Song Sparrow, Turkey Vulture, Blue Jay, Wild Turkey, Eastern Common, Mourning Dove **Mammals:** White-tailed Deer, Raccoon **Lepidoptera:** Cabbage White, Red Admiral **Herpetofauna:** Spring Peeper
		9-Nov-11	18-Apr-12 19-Apr-12	SWD2-2	Green Ash Mineral Deciduous Swamp Type (east of Turbine 37)		2.1	Mid-age	This mid-age deciduous swamp is dominated by green ash.	**Birds:** American Woodcock, American Crow, American Pipit, Killdeer, American Robin, White-breasted Nuthatch, Turkey Vulture, Downy Woodpecker, Black-capped Chickadee, Belted Kingfisher, Northern Flicker, Blue Jay **Mammals:** White-tailed Deer, Gray Squirrel **Lepidoptera:** Red Admiral, Cabbage White, Clouded Sulphur, Grey Comma **Herpetofauna:** Green Frog, Eastern Newt, Spring Peeper
		21-Sep-11	13-Oct-11 18-Apr-12 19-Apr-12	FOD9-4	Fresh - Moist Shagbark Hickory Deciduous Forest Type (east of Turbine 37) Surveyed from fence line		4.2	Mid-age	The canopy of this mid-age deciduous forest was dominated by shagbark hickory with lesser amounts of green ash and basswood. The sub-canopy is dominated by blue beech, ironwood and basswood while the herbaceous layer was comprised of running strawberry bush, immature green ash and immature shagbark hickory.	**Birds:** American Woodcock, Blue Jay, American Crow, American Pipit, Killdeer, American Robin, White-breasted Nuthatch, Turkey Vulture, Downy Woodpecker, Black-capped Chickadee, Belted Kingfisher, Northern Flicker **Lepidoptera:** Clouded Sulphur, Cabbage White, Red Admiral, Grey Comma **Herpetofauna:** Green Frog, Eastern Newt, Spring Peeper **Mammals:** White-tailed Deer, Gray Squirrel
		13-Oct-11	9-Nov-11	CUT1h	Green Ash Mineral Cultural Thicket Type	MAM2-2: Reed Canary Grass Mineral Meadow Marsh OAO: Open Aquatic CUM1-1: Dry - Moist Old Field Meadow Type	1.4	Young	This young regenerating cultural thicket is dominated by green ash. The sub-canopy consists of green ash with lesser amounts of hawthorn. Other species observed include tall goldenrod, aster species and Kentucky bluegrass. The meadow marsh inclusion is dominated by reed canary grass with a small pond.	**Birds:** American Woodcock, Blue Jay, American Crow, American Pipit, Killdeer, American Robin **Lepidoptera:** Clouded Sulphur, Cabbage White **Herpetofauna**: Green Frog, Eastern Newt, Spring Peeper **Mammals:** White-tailed Deer

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
		13-Oct-11	18-Apr-12	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type (northeast of Turbine 36)		0.8	Mature	This mature swamp is dominated by Freeman's maple with less shagbark hickory and black ash. The sub-canopy consists of Freeman's maple and white elm. The ground layer consists of fowl manna grass. This area exhibits evidence of seasonal flooding.	**Birds:** Song Sparrow, Turkey Vulture, Black-capped Chickadee, Blue Jay, American Robin, Wild Turkey, Mourning Dove **Mammals:** White-tailed Deer, Raccoon **Lepidoptera:** Cabbage White, Red Admiral, Eastern Comma
		13-Oct-11	18-Apr-12	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type (southeast of Turbine 36)		1.4	Mid-age	The canopy layer in this mid-age swamp community consists of freeman's maple. Other species observed include shagbark hickory, black ash and white elm. The area exhibits evidence of seasonal flooding.	**Birds:** Song Sparrow, American Robin, Red-bellied Woodpecker, Northern Flicker, White-crowned Sparrow, Swamp Sparrow, American Crow, Killdeer, Song Sparrow, Turkey Vulture, Black-capped Chickadee, Blue Jay, Wild Turkey, Mourning Dove **Lepidoptera:** Cabbage White, Red Admiral, Eastern Comma **Herpetofauna:** Spring Peeper, Green Frog, Eastern Newt **Mammals:** White-tailed Deer, Gray Squirrel
		13-Oct-11	18-Apr-12	FOD9-4	Fresh - Moist Shagbark Hickory Deciduous Forest Type (southeast of Turbine 36)	SWD2a: Shagbark Hickory - Green Ash Deciduous Swamp Type MAM2-2: Reed-canary Grass Mineral Meadow Marsh Type	3.0	Mid-age	The canopy layer of this mid-age deciduous forest is dominated by shagbark hickory with small amounts of white elm within the sub-canopy. The shrub layer is dominated by shagbark hickory, while the herbaceous layer consists of herb-robert, running strawberry bush, tall white aster, immature white ash and garlic mustard.	**Birds:** Song Sparrow, Turkey Vulture, Blacked-capped Chickadee, Blue Jay, American Robin, Wild Turkey, Eastern Common, Mourning Dove **Mammals:** White-tailed Deer, Raccoon **Lepidoptera:** Cabbage White, Red Admiral
		21-Sep-11	18-Apr-12 19-Apr-12	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type (southeast of Turbine 37)		3.7	Mid-age	The canopy of this mid-age deciduous swamp is dominated by freeman's maple with lesser amounts of shagbark hickory. The sub-canopy is comprised of white elm and freeman's maple with lesser amounts of green ash. Dominant species observed within the herbaceous layer include hop sedge, fowl manna grass, rice cut grass and dwarf raspberry. Seasonal ponding was found throughout and the swamp appears to contain good amphibian breeding habitat.	**Birds:** Turkey Vulture, Downy Woodpecker, Black-capped Chickadee, Belted Kingfisher, Northern Flicker, Blue Jay, American Crow, White-Breasted Nuthatch, Common Yellowthroat, Eastern Wood-pewee, Hairy Woodpecker, **Herpetofauna:** Spring Peeper **Lepidoptera:** Monarch, Red Admiral, Cabbage White, Grey Comma **Mammals:** White-tailed Deer, Gray Squirrel **Odonata:** Common Green Darner
		13-Oct-11	18-Apr-12 4-July-12	FOD9b	Fresh - Moist Shagbark Hickory - White Ash - Beech Deciduous Forest Type (northeast of Turbine 36)	SAS1-3: Stonewort Submerged Shallow Aquatic Type	6.0	Mid-age	This mid-age deciduous forest has no clear dominant species observed within the canopy. Species observed include shagbark hickory, white ash, red oak and American beech. There is a small pond located at the edge of the forest. Water depth in the pond was approximately 1 m at the time of investigation although there had been recent rain.	**Birds:** Song Sparrow, Turkey Vulture, Black-capped Chickadee, Blue Jay, American Robin, Wild Turkey, Mourning Dove **Mammals:** White-tailed Deer, Raccoon **Herpetofauna**: Green Frog (abundant tadpoles) **Lepidoptera:** Cabbage White, Red Admiral, Eastern Comma
240	0.7	13-Dec-11	24-Apr-12	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type Surveyed from fence line		0.7	Mid-age	This mid-age deciduous forest is dominated by green ash with lesser amounts of bur oak, sugar maple and basswood. The sub-canopy is dominated by green ash. The shrub layer is dominated by choke cherry. There is no ground cover layer.	**Birds:** American Robin, Northern Flicker, Red-winged Blackbird, Brown-headed Cowbird
242	3.7	24-Apr-12		FOD6-1	Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type		3.7	Mature	The canopy layer within this mature forest is dominated by sugar maple with fewer green ash, white elm and basswood. The sub-canopy layer consists of bitternut hickory, sugar maple and green ash. Species within the shrub layer consist of choke cherry and sugar maple. The ground cover consists of spotted geranium, yellow trout lily, garlic mustard and toothwort.	**Birds:** Song Sparrow, American Robin, Savannah Sparrow, Vesper Sparrow, Blue Jay, American Goldfinch, Indigo Bunting, Eastern Wood-pewee, Gray Catbird, Northern Flicker, Downy Woodpecker, Hairy Woodpecker, Red-bellied Woodpecker, Red-winged Blackbird, Field Sparrow, Northern Cardinal **Herpetofauna:** Spring Peeper **Mammals:** Coyote, Mink, Raccoon, Gray Squirrel, White-tailed Deer
244	8.7	27-Apr-12		FOD6-5	Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type Surveyed from fence line		8.1	Mid-age	The canopy layer within this mid-age forest is dominated by sugar maple with fewer basswood and less white ash and shagbark hickory. The sub-canopy is dominated by sugar maple. Species within the shrub layer consist of white elm with less choke cherry. The ground cover consists of yellow trout lily with less spotted geranium.	**Birds:** Turkey Vulture, Brown Thrasher, Hairy Woodpecker, Yellow-bellied Sapsucker, Vesper Sparrow, White-breasted Nuthatch, Downy Woodpecker, Northern Flicker, Blue Jay, House Wren, American Crow, Brown-headed Cowbird
		27-Apr-12		SWD3-3	Swamp Maple Mineral Deciduous Swamp Type		0.6	Mid-age	The canopy cover within this mid-age swamp community is dominated by Freeman's maple with fewer green ash. The sub-canopy is dominated by Freeman's maple with fewer green ash. The shrub layer is dominated by white elm with fewer nannyberry. The ground cover consists of sedge species, with fewer reed canary grass.	**Birds:** Turkey Vulture, Brown Thrasher, Hairy Woodpecker, Yellow-bellied Sapsucker, Vesper Sparrow, White-breasted Nuthatch, Downy Woodpecker, Northern Flicker, Blue Jay, House Wren, American Crow, Brown-headed Cowbird

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
245	6.9	4-Oct-11	23-Apr-12	FOD6-4	Fresh - Moist Sugar Maple - White Elm Deciduous Forest Type		2.0	Mid-age	The canopy layer within this mid-age deciduous forest consists of sugar maple and white elm with lesser amounts of basswood and shagbark hickory. The sub-canopy consists of white elm, sugar maple, white ash and blue beech. The shrub layer includes white ash, sugar maple, calico aster and blue beech. Species found within the herbaceous layer consist of running strawberry bush, position ivy, white ash and avens species.	**Birds:** Cedar Waxwing, Song Sparrow, Turkey Vulture, Killdeer, Eastern Phoebe, Black-capped Chickadee, Vesper Sparrow, Red-winged Blackbird, Song Sparrow, American Robin, Red-tailed Hawk, Blue Jay, Downy Woodpecker, Brown-headed Cowbird **Lepidoptera:** Red Admiral **Mammals:** Raccoon, White-tailed Deer
245	6.9	23-Apr-12		FOD6-5	Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type		2.0	Mid-age	The canopy layer within this mid-age forest is mainly sugar maple with fewer white elm, less white ash and less bitternut hickory. The sub-canopy is dominated by sugar maple. The shrub layer is dominated by choke cherry with fewer sugar maple. The ground cover consists of spotted geranium, yellow trout lily, white trillium, and map apple.	**Birds:** Song sparrow, Turkey Vulture, Killdeer, Eastern Phoebe, Black-capped Chickadee, Vesper Sparrow, Red-winged Blackbird, Song Sparrow, American Robin, Red-Tailed Hawk, Blue Jay, Downey Woodpecker, Brown-headed Cowbird **Lepidoptera:** Red Admiral **Mammals:** Raccoon, White-tailed Deer
		8-Sep-11	9-Nov-11 23-Apr-12	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type	SWD3-3: Swamp Maple Mineral Deciduous Swamp Type CUP1c: Black Walnut - Red Oak Deciduous Plantation Type FOD5b: Dry - Fresh Sugar Maple - White Ash - Basswood Deciduous Forest Type FOD7e: Fresh - Moist Green Ash - White Elm Deciduous Forest Type SWD4a: Swamp Maple - Green Ash Deciduous Swamp Type	3.0	Mature	This mature community is a mosaic of deciduous forest and deciduous swamp communities. The canopy cover is dominated by green ash and freeman's maple with lesser amounts of bur oak and basswood. The sub-canopy layer consists of white elm. The shrub layer is dominated by choke cherry. The ground cover layer was mainly comprised of graceful sedge, tall white aster, running strawberry bush and herb-robert. Swamp Maple Mineral Deciduous Swamp Type (SWD3-3) inclusions were found throughout. The canopy layer within the mid-age CUP1c inclusion consists of equal amounts of red oak and black walnut with lesser amounts of bur oak. The sub-canopy consists of equal amounts of sugar maple, basswood and white elm. Calico aster and sedge species were found within the herbaceous layer. The red oak and black walnut were likely planted as they are evenly aged however are not in rows and appear natural. The canopy within the mature FOD5b inclusion includes equal amounts of white ash and basswood with lesser amounts of sugar maple. The sub-canopy consists of equal amounts of sugar maple, basswood and white elm. The shrub layer consist of equal amounts of choke cherry and sugar maple. The canopy layer within the mid-age FOD7e inclusion is mainly green ash with fewer white elm. The sub-canopy layer is mainly white elm with less basswood and less sugar maple. There is no shrub layer. The ground cover consists of sedge species. The canopy within the mature SWD4a inclusion consists of equal amounts of Freeman's maple and green ash. The sub-canopy consists of equal amounts of freeman's maple and white elm.	**Birds:** Eastern Wood-pewee, White-breasted Nuthatch, House Wren, Red-eyed Vireo, American Goldfinch, American Robin, Song Sparrow, Turkey Vulture, Killdeer, Eastern Phoebe, Black-capped Chickadee, Vesper Sparrow, Red-winged Blackbird, Red-tailed Hawk, Blue Jay, Downy Woodpecker, Brown-headed Cowbird **Lepidoptera:** Red Admiral **Mammals:** Raccoon, White-tailed Deer
249	7.8	4-Jul-12		SWD2-2	Green Ash Deciduous Mineral Swamp Type Surveyed from fence line		0.6	Mid-age	The canopy within this mid-age swamp consists mainly of green ash with fewer white elm. The sub-canopy layer consists mainly of green ash with fewer white elm. There is no shrub layer. The ground cover consists of reed canary grass.	**Birds:** Red-winged Blackbird **Herpetofauna:** Green Frog
		27-Apr-12		OAO	Open Aquatic Surveyed from fence line		0.1	Mid-age	This is an open pond surrounded by a small treed area.	**Birds:** Horned Lark, Killdeer, Song Sparrow
250	10.6	10-Aug-11	18-May-12	FOD5-1	Dry - Fresh Sugar Maple Deciduous Forest Type	CUM1-1: Dry - Moist Old Field Meadow Type	10.6	Young to Mid-age	This young to mid-age deciduous forest is dominated by sugar maple with lesser amounts of white elm, white ash and American beech. The sub-canopy is dominated by sugar maple. The shrub layer is dominated by sugar maple with less amounts of choke cherry. The ground cover consists of a violet species and yellow trout lily.	**Birds**: Turkey Vulture, Red-winged Blackbird, Song Sparrow, Blue Jay, Rose-breasted Grosbeak, Chipping Sparrow, American Crow, American Goldfinch, Yellow Warbler **Mammals:** White-tailed Deer **Herpetofauna:** Spring Peeper, Eastern Garter Snake

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
251	2.0	14-Oct-11		FOD5-7	Dry - Fresh Sugar Maple-Black Cherry Deciduous Forest Type		0.7	Mid-age	The canopy layer of this mid-age deciduous forest includes sugar maple and black cherry. The sub-canopy is dominated by sugar maple, while the shrub layer is dominated by red raspberry. The herbaceous layer consists of running strawberry bush and graceful sedge.	**Birds:** Northern Flicker, Red-bellied Woodpecker, Blue Jay, American Crow, Dark-eyed Junco, American Pipit
		14-Oct-11		FOD5-1	Dry - Fresh Sugar Maple Deciduous Forest Type	FOD4-1: Dry - Fresh Beech Deciduous Forest Type	1.0	Mature	The canopy layer of this mature deciduous forest is dominated by sugar maple with lesser amounts of bitternut hickory. The sub-canopy is dominated by sugar maple. The herbaceous layer consisted of running strawberry bush and garlic mustard. Dominant species observed within the canopy of the mature FOD4-1 inclusion include American beech, basswood, white ash and sugar maple. The sub-canopy includes sugar maple and iron wood. The shrub layer is dominated by American beech, and the herbaceous species observed include zig zag goldenrod and poison ivy.	**Birds:** Northern Flicker, Red-bellied Woodpecker, Blue Jay, American Crow, Dark-eyed Junco, American Pipit
255	138.5	9-May-12		FOM5-2	Dry - Fresh Poplar Mixed Forest Type Surveyed from roadside	CUM1-1: Dry - Moist Old Field Meadow Type OAO: Open Aquatic	36.9	Young	The canopy layer within this young forest community consists of trembling aspen and scots pine. The sub-canopy consists of trembling aspen and scots pine. The shrub layer is mainly nannyberry and gray dogwood. The ground cover consists of grasses.	**Birds:** Common Yellowthroat, Rose-breasted Grosbeak, Red-winged Blackbird, Black-capped Chickadee, American Crow, Horned Lark, Field Sparrow, Savannah Sparrow, Canada Goose, Northern Flicker, Wood Thrush, Brown-headed Cowbird, Blue Jay, Blue-winged Warbler, Chipping Sparrow, Ruby-throated Hummingbird, Baltimore Oriole, American Goldfinch **Lepidoptera:** Red Admiral **Mammals:** Gray Squirrel **Herpetofauna:** Spring Peeper
258	194.5	29-Nov-11	1-May-12	CUM1-1	Dry - Moist Old Field Meadow Type	CUP3: Coniferous Plantation Ecosite SWD3-3: Swamp Maple Mineral Deciduous Swamp Type	0.5	Pioneer to Young	There is no canopy or sub-canopy within this pioneer to young meadow. The shrub layer consists of red-osier dogwood with fewer black raspberry and less nannyberry. The ground cover consists of tall goldenrod with fewer reed canary grass and less Canada blue grass. There is no canopy layer within the young to mid-age coniferous plantation inclusion. The sub-canopy consists of white spruce and scots pine. The shrub layer consists of white spruce and scots pine. The ground cover is dominated by common dandelion. The canopy within the mid-age swamp inclusion is dominated by Freeman's maple with less green ash. The sub-canopy layer is dominated by Freeman's maple. Species within the shrub layer consist of red-osier dogwood, choke cherry and common buckthorn. The ground cover is long-stalked sedge.	**Birds:** Field Sparrow, Turkey Vulture, Red-tailed Hawk, American Robin, Horn Lark, Song Sparrow, Mourning Dove, American Goldfinch, Brown-headed Cowbird, Black-capped Chickadee, Northern Flicker, White-throated Sparrow, Savannah Sparrow, American Crow, Chipping Sparrow
		21-Sep-11	25-Apr-12	FOD7-1	Fresh - Moist White Elm Lowland Deciduous Forest Type		8.7	Mature	The canopy layer of this mature deciduous forest is dominated by white elm with lesser amounts of white ash and basswood. Species observed within the sub-canopy consist of white ash, sugar maple and hawthorn. The herbaceous layer consists of garlic mustard, calico aster, wild black currant, poison ivy, running strawberry bush, yellow avens and wood nettle.	**Birds:** Pileated Woodpecker, American Robin, Killdeer, Blue Jay, Downy Woodpecker, Black-capped Chickadee, Yellow-bellied Sapsucker, Red-winged Blackbird, Brown-headed Cowbird, American Goldfinch Herpetofauna: Green Frog, Wood Frog **Mammals:** Eastern Chipmunk, White-tailed Deer **Lepidoptera:** Red Admiral, Cabbage White **Crustaceans:** Chimney Crayfish
		19-Jul-11	21-Sept-11 25-Apr-12	FOD9-4	Fresh - Moist Shagbark Hickory Deciduous Forest Type	SWD2-2: Green Ash Mineral Deciduous Swamp Type SWD3-3: Swamp Maple Mineral Deciduous Swamp Type	82.7	Young to Mid-age	The canopy layer of this young to mid-age deciduous forest is dominated by sugar maple, shagbark hickory and white ash. The sub-canopy layer consists of sugar maple, bitternut hickory, blue beech and ironwood. The shrub layer is dominated by alternate-leaved dogwood, calico aster, swamp red currant, blackberry and northern lady fern. The herbaceous layer consists of sedge, blue violet, garlic mustard, common speedwell, poison ivy, drooping wood sedge and star-flowered solomon's seal. Portions of this community were young with lots of pole size trees. There is a stream located along the edge of the forest where there is a more disturbed open canopy.	**Birds:** Pileated Woodpecker, American Robin, Killdeer, Blue Jay, Downy Woodpecker, Black-capped Chickadee, Yellow-bellied Sapsucker, Red-winged Blackbird, Brown-headed Cowbird, American Goldfinch Herpetofauna: Green Frog, Wood Frog **Mammals:** Eastern Chipmunk, White-tailed Deer **Lepidoptera:** Red Admiral, Cabbage White **Crustaceans:** Chimney Crayfish

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
259	19.6	9-Sep-11		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type (north of Turbine 21)		0.5	Young	The canopy layer in this young deciduous forest is dominated by green ash with lesser amounts of shagbark hickory. The sub-canopy layer consists of green ash, white elm and hawthorn species. The herbaceous layer was mainly comprised of tall goldenrod, poison-ivy, white avens, graceful sedge, and Virginia strawberry.	**Birds:** Blue Jay, American Crow, Red-winged Blackbird, House Wren, Black-capped Chickadee, American Robin, Eastern Wood-pewee, White-breasted Nuthatch, American Goldfinch, Northern Flicker, Downy Woodpecker, White-throated Sparrow, Black-and-white Warbler, Blackpoll Warbler, Red-eyed Vireo **Lepidoptera:** Appalachian Brown, Cabbage White, Monarch, Red-spotted Purple **Herpetofauna:** Wood Frog, Spring Peeper **Mammals:** Raccoon, Gray Squirrel, Eastern Chipmunk
		9-Sep-11		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type (southwest of Turbine 66)		0.7	Young to Mid-age	The canopy layer of this young to mid-age deciduous forest is dominated by green ash with lesser amounts of trembling aspen. The sub-canopy layer consists of green ash and hawthorn species. The herbaceous layer was mainly comprised of enchanter's nightshade and tall white aster.	**Birds:** Blue Jay, American Crow, Red-winged Blackbird, House Wren, Black-capped Chickadee, American Robin, Eastern Wood-pewee, White-breasted Nuthatch, American Goldfinch, Northern Flicker, Downy Woodpecker, White-throated Sparrow, Black-and-white Warbler, Blackpoll Warbler, Red-eyed Vireo **Lepidoptera:** Appalachian Brown, Cabbage Looper, Monarch, Red-spotted Purple **Herpetofauna:** Wood Frog, Spring Peeper **Mammals:** Raccoon, Gray Squirrel, Eastern Chipmunk
		9-Sep-11		SWD2-2	Green Ash Mineral Deciduous Swamp Type		1.5	Mid-age	The canopy within this mid-age swamp consists of green ash with lesser amounts of shagbark hickory. The sub-canopy consists of green ash and white elm. The ground cover consists of fowl manna grass, sedge species and panicled aster.	**Birds:** Blue Jay, American Crow, Red-winged Blackbird, House Wren, Black-capped Chickadee, American Robin, Eastern Wood-pewee, White-breasted Nuthatch, American Goldfinch, Northern Flicker, Downy Woodpecker, White-throated Sparrow, Black-and-white Warbler, Blackpoll Warbler, Red-eyed Vireo **Lepidoptera:** Appalachian Brown, Cabbage White, Monarch, Red-spotted Purple **Herpetofauna:** Wood Frog, Spring Peeper **Mammals:** Raccoon, Gray Squirrel, Eastern Chipmunk
		9-Sep-11		FOD9-4	Fresh - Moist Shagbark Hickory Deciduous Forest Type	FOD7-2: Fresh - Moist Ash Lowland Deciduous Forest Type	1.9	Mid-age	The canopy of this mid-age deciduous forest is dominated by shagbark hickory with lesser amounts of bur oak. The sub-canopy layer consists of shagbark hickory, white elm, sugar maple and blue beech. The shrub layer is dominated by blue beech, choke cherry and green ash. The herbaceous layer was mainly comprised of Virginia strawberry, sedge species and running strawberry bush. Open canopy is present (50-60%) from selective cutting within past two years.	**Birds:** Blue Jay, American Crow, Red-winged Blackbird, House Wren, Black-capped Chickadee, American Robin, Eastern Wood-pewee, White-breasted Nuthatch, American Goldfinch, Northern Flicker, Downy Woodpecker, White-throated Sparrow, Black-and-white Warbler, Blackpoll Warbler, Red-eyed Vireo **Lepidoptera:** Appalachian Brown, Cabbage White, Monarch, Red-spotted Purple **Herpetofauna:** Wood Frog, Spring Peeper **Mammals:** Raccoon, Gray Squirrel, Eastern Chipmunk
		9-Sep-11		SWD4a	Swamp Maple - Green Ash Deciduous Swamp Type	FOD7-2: Fresh - Moist Ash Lowland Deciduous Forest Type	3.6	Mid-age	The canopy layer of this mid-age deciduous swamp is co-dominated by freeman's maple and green ash. The sub-canopy layer consists of white elm and freeman's maple. The shrub layer is dominated by white elm. The herbaceous layer was mainly comprised of sedge species, fowl meadow grass and tall white aster. There is a broken canopy (60% cover) from selective cutting. There is also strong evidence of seasonal flooding, although no water was present at the time of site investigation. There may be suitable amphibian breeding habitat.	**Birds:** Blue Jay, American Crow, Red-winged Blackbird, House Wren, Black-capped Chickadee, American Robin, Eastern Wood-pewee, White-breasted Nuthatch, American Goldfinch, Northern Flicker, Downy Woodpecker, White-throated Sparrow, Black-and-white Warbler, Blackpoll Warbler, Red-eyed Vireo **Lepidoptera:** Appalachian Brown, Cabbage White, Monarch, Red-spotted Purple **Herpetofauna:** Wood Frog, Spring Peeper **Mammals:** Raccoon, Gray Squirrel, Eastern Chipmunk **Hemiptera:** Annual Cicada
		9-Sep-11		FOD5-1	Dry - Fresh Sugar Maple Deciduous Forest Type		4.7	Mature	The canopy layer of this mature deciduous forest is dominated by sugar maple with lesser amounts of American basswood and white ash. The sub-canopy layer consists of sugar maple, blue beech, American basswood and shagbark hickory. The shrub layer is dominated by sugar maple with lesser amounts of choke cherry. The herbaceous layer is mainly comprised of running strawberry bush, zigzag goldenrod, sedge species, and calico aster.	**Birds:** Blue Jay, American Crow, Red-winged Blackbird, House Wren, Black-capped Chickadee, American Robin, Eastern Wood-pewee, White-breasted Nuthatch, American Goldfinch, Northern Flicker, Downy Woodpecker, White-throated Sparrow, Black-and-white Warbler, Blackpoll Warbler, Red-eyed Vireo **Lepidoptera:** Appalachian Brown, Cabbage White, Monarch, Red-spotted Purple **Herpetofauna:** Wood Frog, Spring Peeper **Mammals:** Raccoon, Gray Squirrel, Eastern Chipmunk

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
261	9.9	7-Jun-12		FOD9a	Fresh - Moist Bitternut Hickory - Basswood - Ironwood - Bur Oak Deciduous Forest Type		0.8	Mid-age	The canopy of this mid-age forest consists of bitternut hickory, American basswood, ironwood and bur oak. The sub-canopy consists of bitternut hickory, shagbark hickory, sugar maple and green ash. The shrub layer consists of choke cherry and blue beech. The ground cover consists of climbing poison ivy, spotted geranium, tall goldenrod, and white avens.	**Birds:** Blue Jay, House Wren, American Crow, White-breasted Nuthatch, Great Crested Flycatcher, Baltimore Oriole, Eastern Wood-pewee
		30-Apr-12	7-Jun-12 29-Jun-12	FOD6-5	Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type Surveyed from fence line	SWD2-2: Green Ash Mineral Deciduous Swamp Type SWD4: Mineral Deciduous Swamp Ecosite SWD2-2: Green Ash Mineral Deciduous Swamp Type SWT2-9: Gray Dogwood Mineral Thicket Swamp Type	9.1	Mid-age	The canopy layer of this mid-age forest consists of sugar maple, white elm, ironwood, and American beech. The sub-canopy consists of sugar maple and ironwood. The shrub layer consists mainly of choke cherry with less blue beech, sugar maple, American beech and ironwood. The ground cover consists mainly of white trillium, with fewer yellow trout lily, less may apple and less Virginia water leaf. The canopy within the mid-age SWT2-9 inclusion consists of cottonwood, green ash and hybrid crack willow. The sub-canopy consists of green ash, white elm and American beech. The shrub layer consists of green ash with gray dogwood. The ground layer consists of wood nettle, calico aster and reed canary grass.	**Birds:** Downy Woodpecker, Northern Flicker, Blue Jay, Red-winged Blackbird, Horned Lark, Blue Jay, House Wren, American Crow, White-breasted Nuthatch, Great Crested Flycatcher, Baltimore Oriole, Eastern Wood-pewee **Mammals:** Red Fox
266	114.4	3-May-12		SWT2a	Russian Olive – Sandbar Willow – Gray Dogwood Mineral Thicket Swamp	CUP1c: Black Walnut - Red Oak Deciduous Plantation Type	0.8	Mid-age	The canopy of this mid-age swamp consists of green ash and Freeman's maple. There is no sub-canopy. The shrub layer consists of autumn olive, sandbar willow, and gray dogwood. The groundcover is dominated by reed canary grass with fewer common dandelion, sedge species, and clover.	**Birds:** Mallard, American Woodcock, Chipping Sparrow, Mourning Dove, Black-capped Chickadee, Eastern Wood-pewee, Ruffed Grouse, Downy Woodpecker, Blue Jay, Brown-headed Cowbird, Great Blue Heron, American Goldfinch **Lepidoptera:** Red Admiral, Cabbage White **Herpetofauna:** Wood Frog, American Toad **Mammals:** White-tailed Deer **Herpetofauna:** Eastern Garter Snake
		24-Apr-12		OAO	Open Aquatic		0.4	Mid-age	This is an open pond surrounded by a small treed area.	**Herpetofauna:** Spring Peeper
		3-May-12		CUP1b	Bur Oak Deciduous Plantation Type	SWT2a: Russian Olive – Sandbar Willow – Gray Dogwood Mineral Thicket Swamp	2.5	Mid-age	The canopy of this mid-age plantation is dominated by bur oak with less green ash. The sub-canopy layer consists of green ash and sugar maple. The shrub layer consists of mainly green ash with fewer tartarian honeysuckle and less autumn olive. The ground cover consists of common dandelion.	**Birds:** Mallard, American Woodcock, Chipping Sparrow, Mourning Dove, Black-capped Chickadee, Eastern Wood-pewee, Ruffed Grouse, Downy Woodpecker, Blue Jay, Brown-headed Cowbird, Great Blue Heron, American Goldfinch **Lepidoptera:** Red Admiral, Cabbage White **Herpetofauna:** Wood Frog, American Toad **Mammals:** White-tailed Deer **Herpetofauna:** Eastern Garter Snake
		7-Sep-11	24-Apr-12	CUP3-2	White Pine Coniferous Plantation Type Surveyed from roadside	CUM1-1: Dry - Moist Old Field Meadow Type CUT: Cultural Thicket	5.0	Young to Mid-age	The canopy layer of this young to mid-age coniferous plantation is dominated by eastern white pine with lesser amounts of white spruce. The cultural meadow inclusion is dominated by tall goldenrod, goldenrod species, wild carrot, and reed canary grass.	**Birds:** Great Blue Heron (fly over) **Herpetofauna:** Northern Leopard Frog **Mammals:** Red Fox
		3-May-12		CUP1a	Eastern Cottonwood Deciduous Plantation Type	CUP3e: White Pine - Red Pine - Norway Spruce - White Spruce Coniferous Plantation Type CUP1-7: Green Ash Deciduous Plantation Type	5.2	Mid-age	The canopy of this mid-age plantation is mainly eastern cottonwood with fewer basswood and much less white elm and shagbark hickory. The sub-canopy is dominated by green ash. The shrub layer is mainly green ash with fewer choke cherry and less tartarian honeysuckle. The ground cover consists of common dandelion, garlic mustard, wild strawberry, and graceful sedge. The canopy layer within the mid-age CUP3e inclusions consists of eastern white pine, red pine, Norway spruce, and white spruce. The sub-canopy layer consists of green ash. The shrub layer consists mainly of green ash with fewer choke cherry and less tartarian honeysuckle. The ground cover consists of common dandelion, garlic mustard, herb-robert and wild strawberry.	**Birds:** Mallard, American Woodcock, Chipping Sparrow, Mourning Dove, Black-capped Chickadee, Eastern Wood-pewee, Ruffed Grouse, Downy Woodpecker, Blue Jay, Brown-headed Cowbird, Great Blue Heron, American Goldfinch **Lepidoptera:** Red Admiral, Cabbage White **Herpetofauna:** Wood Frog, American Toad **Mammals:** White-tailed Deer **Herpetofauna:** Eastern Garter Snake

Table 3.3 Vegetation Communities Identified Within the 120 m Area of Investigation

Natural Area	Total Size of Natural Area (ha)	Date of Site Investigation	Date Re-visited (if applicable)	ELC Code	ELC Name	Inclusions (if applicable)	Area (ha)	Community Age	Vegetation Composition	Incidental Wildlife Observed
		7-Sep-11	24-Apr-12	FOD4a	Dry - Fresh White Ash - Paper Birch - Cottonwood - White Cedar Deciduous Forest Type Surveyed from roadside		8.1	Young to Mid-age	The canopy layer of this young to mid-age deciduous forest consists of large-toothed aspen, white ash, sugar maple, paper birch, cottonwood and white cedar. The shrub layer is dominated by grey dogwood and sugar maple with fewer Freeman's maple and less large-toothed aspen, and the herbaceous layer includes goldenrod species, white trillium, yellow trout lily, common dandelion and aster species.	**Birds:** Great Blue Heron (fly over) **Herpetofauna:** Northern Leopard Frog **Mammals:** Red Fox
		n/a		SWM	Mixed Swamp Community Series		12.8	Unknown	This community was identified through air photo interpretation.	Not applicable.
267	5.1	14-Oct-11		FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type		5.1	Mid-age	Species observed within the canopy of this narrow band of mid-age deciduous forest include green ash with lesser amounts of white elm, bur oak, and shagbark hickory.	**Birds:** Red-tailed Hawk, American Robin, Blue Jay **Herpetofauna:** Spring Peeper **Mammals:** Gray Squirrel
269	3.7	18-Apr-12		FOD5-2	Dry - Fresh Sugar Maple - Beech Deciduous Forest Type		2.0	Mature	The canopy layer within the mature forest consists mainly of sugar maple and American beech with fewer basswood and ironwood. The sub-canopy is comprised of equal amounts of sugar maple, American beech, and ironwood. Species found within the shrub layer include mainly blue beech with some choke cherry and less American beech. The ground cover is comprised of yellow trout lily, running strawberry bush, white trillium and spotted geranium. An abundance of downed woody debris was noted.	**Birds:** Downy Woodpecker, Gray Catbird, American Robin, Red-winged Blackbird, Song Sparrow, Black-capped Chickadee, Northern Flicker **Mammals:** White-tailed Deer **Lepidoptera:** Red Admiral
		18-Apr-12		SWD2-2	Green Ash Mineral Deciduous Swamp Type	FOD5-2: Dry - Fresh Sugar Maple - Beech Deciduous Forest Type	1.7	Mature	The canopy layer within this mature forest community consists mainly of green ash with a moderate amount Freeman's maple and fewer eastern cottonwood. The sub-canopy and shrub layers are comprised of Freeman's maple. The ground cover is comprised of mainly sedge species.	**Birds:** Downy Woodpecker, Gray Catbird, American Robin, Red-winged Blackbird, Song Sparrow, Black-capped Chickadee, Northern Flicker **Mammals:** White-tailed Deer **Lepidoptera:** Red Admiral
271	6.6	26-Apr-12		FOD6-4	Fresh - Moist Sugar Maple - White Elm Deciduous Forest Type	CUM1-1: Dry - Moist Old Field Meadow Type	6.6	Mid-age	The canopy within this mid-age forest is mainly sugar maple with fewer white elm. The sub-canopy is dominated by sugar maple with less white elm. The shrub layer is mainly choke cherry with less white elm. The ground cover consists of yellow trout lily, spotted geranium and garlic mustard.	**Birds:** Yellow-bellied Sapsucker, Turkey Vulture
273	0.9	2-May-12		FOD8-1	Fresh - Moist Poplar Deciduous Forest Type	SWD3-3: Swamp Maple Mineral Deciduous Swamp Type	0.9	Young	The canopy within this young forest is dominated by trembling aspen with less basswood, white elm, and green ash. The sub-canopy consists of mainly white elm, with fewer blue beech, less Freeman's maple, and even less basswood. The shrub layer consists of chock cherry, blue beech, and wild black currant. The ground cover consists of false solomon's seal, garlic mustard, common dandelion, and goldenrod species.	**Birds:** American Robin, Red-winged Blackbird, Blue Jay, Song Sparrow, Brown-headed Cowbird **Lepidoptera:** Red Admiral, Cabbage White **Mammals:** White-tailed Deer
274	3.1	2-May-12		MAM3-2	Reed-canary Grass Organic Meadow Marsh Type Surveyed from roadside		0.5	Young	There is no canopy or sub-canopy within this young meadow marsh. The shrub layer is dominated by sandbar willow with less red-osier dogwood. The ground cover is dominated by reed canary grass with fewer goldenrod species and less aster species.	**Birds:** Red-winged Blackbird, American Robin, Blue Jay **Lepidoptera:** Cabbage White, Red Admiral
		2-May-12		SWD6-3	Swamp Maple Organic Deciduous Swamp Type Surveyed from roadside		2.6	Mid-age	The canopy within this mid-age swamp is dominated by Freeman's maple with fewer green ash and less basswood. There is no sub-canopy layer. The shrub layer consists of gray dogwood. There was no ground cover layer.	**Birds:** Red-winged Blackbird, American Robin, Blue Jay **Lepidoptera:** Cabbage White, Red Admiral
275	8.1	8-May-12		FOD6-5	Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type Surveyed from fence line		5.9	Mid-age	The canopy layer within this mid-age forest is mainly sugar maple with less basswood, American beech and white ash. The sub-canopy layer is mainly sugar maple with less basswood, American beech and white ash. The shrub layer is mainly blue beech with less choke cherry, shagbark hickory, and white ash. The ground cover consists of mainly spotted geranium, yellow trout lily, wild strawberry and false solomon's seal.	**Birds:** Song Sparrow, Savannah Sparrow, Rose-breasted Grosbeak, Canada Goose, Brown-headed Cowbird, Blue Jay, Mallard
		8-May-12		SWD3-3	Swamp Maple Mineral Deciduous Swamp Type		1.5	Mid-age to Mature	The canopy layer within this mid-age to mature forest is dominated by Freeman's maple with fewer green ash and less white elm. The sub-canopy layer is mainly white elm with less Freeman's maple and green ash. The shrub layer is dominated by green ash with fewer white elm and less Freeman's maple. The ground cover consists of moneywort, spotted geranium, and poison ivy.	**Birds:** Song Sparrow, Savannah Sparrow, Rose-breasted Grosbeak, Canada Goose, Brown-headed Cowbird, Blue Jay, Mallard