Bornish Wind Energy Centre
Natural Heritage Site Investigation Report

Prepared for:
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Project No. 1231

Date: March 2012

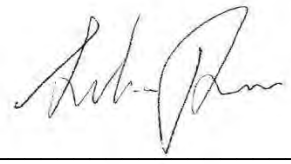
NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Bornish Wind Energy Centre
Natural Heritage Site Investigation Report

Project Team:

Staff	Role
Andrew G. Ryckman	Project Manager/Biologist
David E. Stephenson	Senior Terrestrial and Wetland Biologist
Charlotte S. Moore	Terrestrial and Wetland Biologist
Graham Wright	Terrestrial and Wetland Biologist
Heather L. Wright	Terrestrial and Wetland Biologist
Kaitlin N. Powers	Terrestrial and Wetland Biologist
Katherine T. Clapham	Terrestrial and Wetland Biologist
Nathan G. Miller	Terrestrial and Wetland Biologist
Patrick W. Deacon	Terrestrial and Wetland Biologist
Sophie A. Gibbs	Terrestrial and Wetland Biologist
Gerry Schaus	GIS Technician

Report submitted on March 29, 2012



Andrew G. Ryckman

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1.0 Project Description

Natural Resource Solutions Inc. (NRSI) was retained in April 2011 by GL-Garrad Hasson on behalf of NextEra Energy Canada, ULC (NextEra) to conduct a natural environment resource assessment in accordance with the Renewable Energy Approval (REA) Regulation, Ontario Regulation 359/09. This assessment includes a records review, site investigation, evaluation of significance, and impact assessment of any potentially significant natural features or wildlife habitats at a proposed 72.9 MW wind energy generating facility in North Middlesex, Middlesex County Ontario. The analysis of the natural heritage features and biological factors affecting the proposed site is one issue being considered. Other factors, such as land ownership, social impacts, and cultural impacts are also being assessed by other team members, and will be addressed under separate covers as outlined by the REA Regulation.

The Bornish Wind Energy Centre ('the Project') will be owned and operated by Bornish Wind, LP, a wholly-owned subsidiary of NextEra. The Project is located in northwestern Middlesex County in the Township of North Middlesex, Ontario. The Bornish Wind Energy Centre is approximately 3.3km south of the Town of Parkhill, Ontario, with the general project area bound to the north by Nairn/Elginfield Road, to the south by Townsend Line, and to the east and west by Broken Front/Scout Road and Fort Rose Road. A transmission line is proposed to run north along Kerwood Road from the substation to Elginfield Road/Nairn Road. This transmission line is then proposed to continue eastward along Nairn Road to an existing 500 kV line and interconnection point located west of Petty Street. The location of the project 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 area was used to facilitate information collection and the Records Review.

The Bornish Wind Energy Centre is proposed to consist of up to forty-five GE 1.6-100 (1.62 MW) turbines installed for a total installed capacity of 72.9 MW. However, locations for forty-eight turbines will be permitted. The proposed GE 1.6-100 turbine is a 3-bladed, upwind, horizontal-axis turbine. The turbine has a total rotor diameter of 100 m, which results in a swept area of 7,854 m^2 and is designed to operate at between 9.75

and 16.18 revolutions per minute (rpm). The turbine rotor and nacelle are mounted on top of an 80 m tubular tower that is manufactured in sections from steel plates. Each turbine is mounted on a steel reinforced concrete foundation and equipped with a transformer, which is located outside the base of the tower.

As identified in the REA Regulation, the proposed layout of these features is collectively referred to as the 'project location'. The project location is defined as per 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 herein, the project location boundary is the outer limit of where site preparation and construction activities will occur (i.e. temporary disturbance areas), and where permanent infrastructure will be located, including the air space occupied by turbine blades.

In accordance with Section 25 of the REA Regulation, NRSI has conducted a thorough records review of available background resources to identify any potentially significant natural features within 120 m of the project location. This includes areas within 120 m of turbine blade tip as well as any areas that may be used as temporary lay-down areas, crane pads, access roads, collection, distribution, and transmission lines. For the purposes of this report, NRSI will refer to the areas within 120 m of the project location as the 'project area'.

Current land uses within the project area consists mainly of agriculture, with major crops including soybeans, corn, wheat, hay as well as existing residential and farm buildings. Natural features are generally small and isolated from other features; however, several large contiguous woodlands are present within the Bornish project area. Habitats within the project area are expected to include woodlands, swamps, meadows, thickets, drainage ditches, ponds, creeks and hedgerows. See Figure 1 for a map of the project area and natural features.

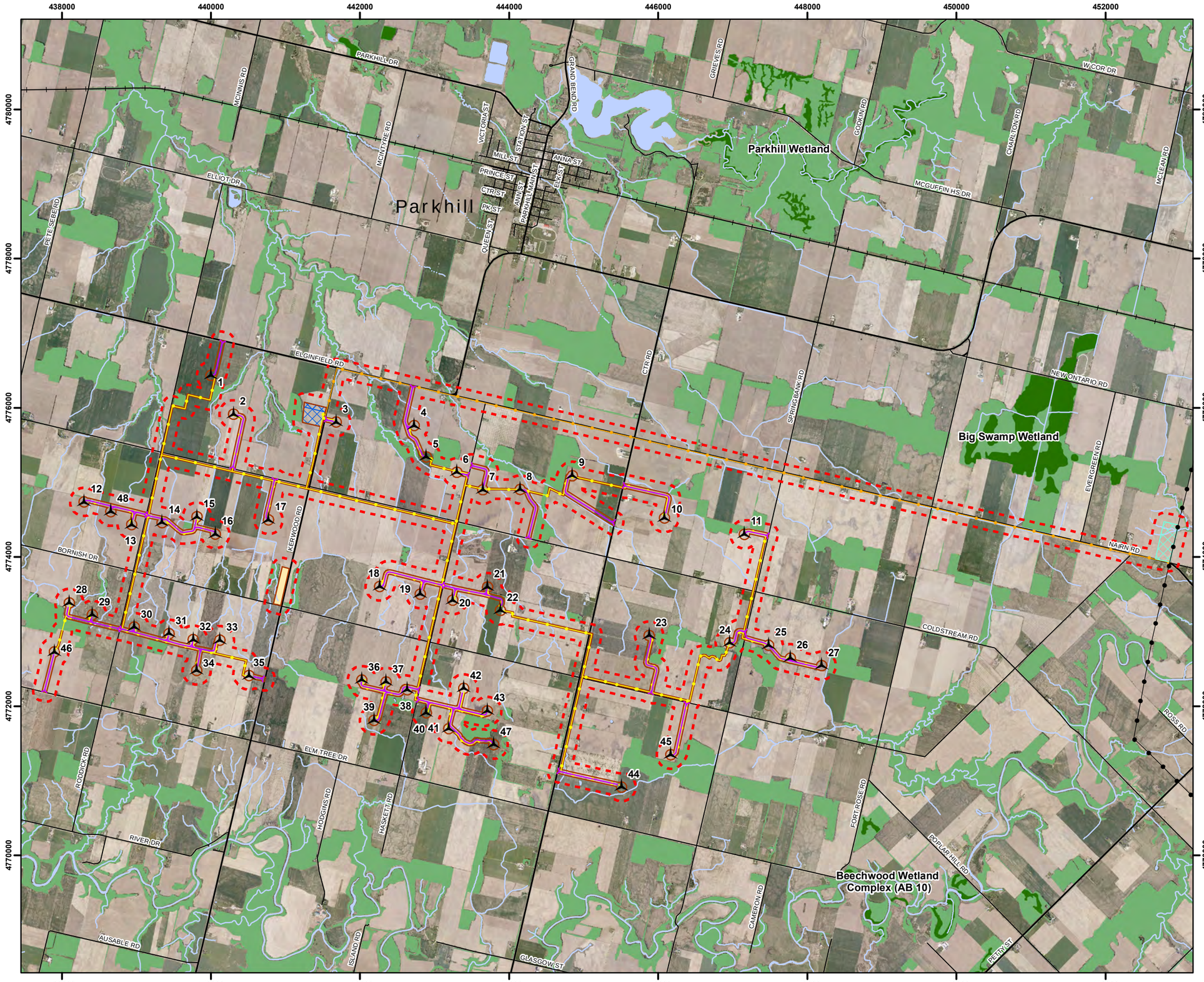
As part of this project, NRSI has considered all aspects relating to provincially Threatened and Endangered species. However, since these species are addressed as part of the *Endangered Species Act* (2007), they have not been discussed within any of

these Natural Heritage Assessment reports. These species will be address in full detail, including a description and results of field assessments, potential impacts, and recommended mitigation measures, as part of a separate *Approval and Permitting Requirements Document (APRD)* to be submitted to the MNR under a separate cover, where necessary.

Figure 1

Bornish Wind Energy Centre

Project Area and Natural Features



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Legend

- Project Area (120m Buffer)
- Turbine
- Access Road
- Collector System
- Interconnection Line
- Project Location
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Railroad
- Primary Road
- Secondary Road
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Provincially Significant Wetland (PSW)
- Other Wetland
- Wooded
- ANSI, Life Science
- ANSI, Earth Science

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Project: 1231 March 30, 2012	NAD83 - UTM Zone 17 Scale: 1:50,000 (11x17")

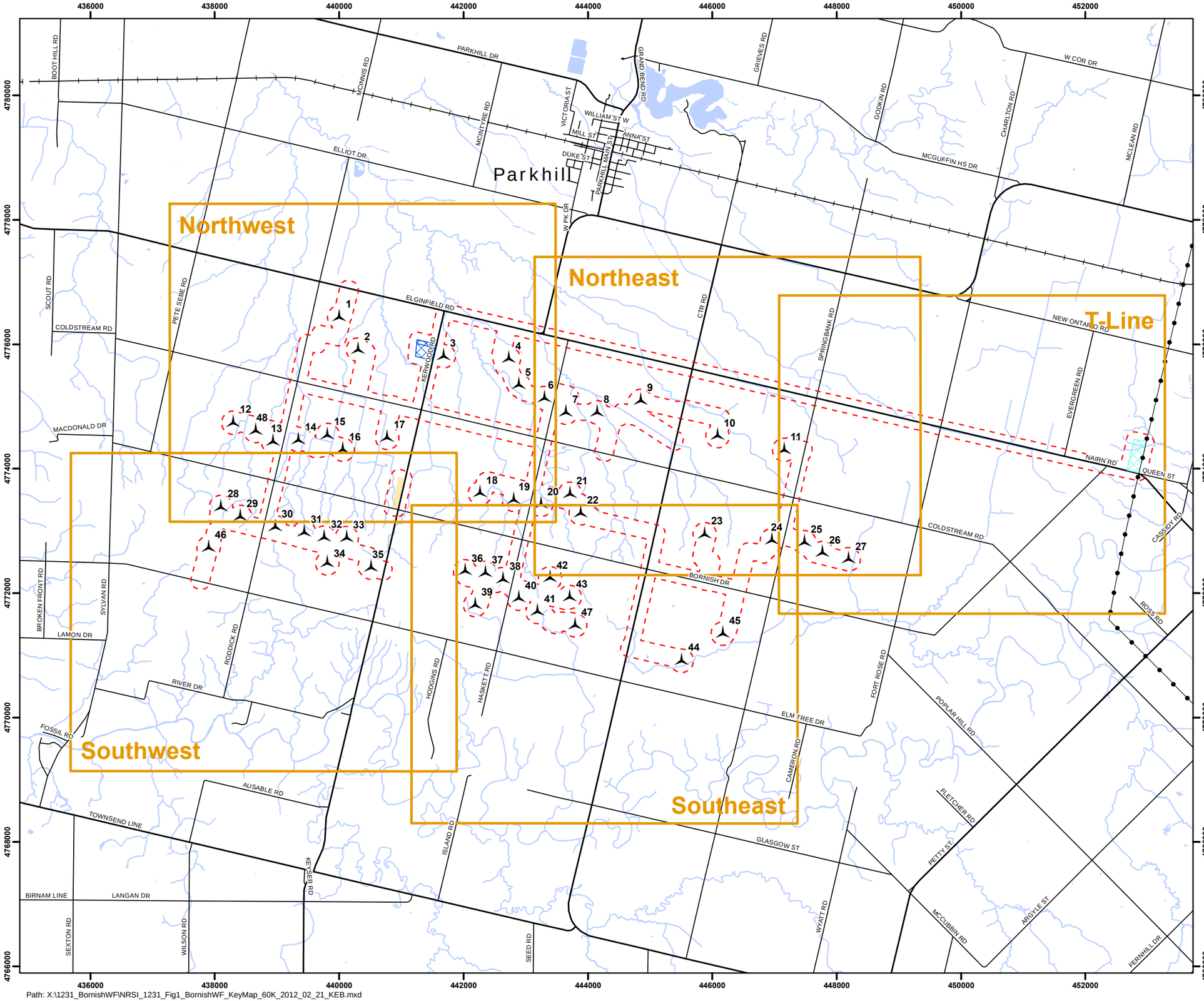
0 1 2 3 Kms

N

Figure 2

Bornish Wind Energy Centre

Key Map



Legend

- Map Extent
- Project Area (120m Buffer)
- Turbine
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Railroad
- Primary Road
- Secondary Road
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1231 April 2, 2012	NAD83 - UTM Zone 17 Scale: 1:50,000 (11x17")

0 1.5 3 4.5
Kms

N

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2.0 REA Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the requirements for the development of renewable energy projects in Ontario. In accordance with the REA Regulation, the Bornish Wind Energy Centre, classified as a Class 4 wind facility, is required to complete a REA.

Section 26 of the REA Regulation requires proponents of Class 4 wind projects to undertake a natural heritage site investigation for the purpose of determining:

1. whether the results of the analysis summarized in the [Natural Heritage Records Review] report prepared under subsection 25 (3) are correct or require correction, and identifying any required corrections.
2. whether any additional natural features exist, other than those that were identified in the Natural Heritage Records Review Report prepared under subsection 25 (3).
3. the boundaries, located within 120m of the project location, of any natural feature that was identified in the records review or the site investigation.
4. the distance from the project location to the boundaries determined under clause (c).

Natural feature definitions are specifically outlined in Section 1.1 of the REA Regulation.

Subsection 3 of Section 26 of the REA Regulation requires the proponent to prepare a report setting which includes the following:

1. A summary of any corrections to the report prepared under subsection 25 (3) and the determinations made as a result of conducting the site investigations under subsection (1).
2. Information relating to each natural feature identified in the records review and in the site investigations, including the type, attributes, composition and function of the feature.
3. A map showing
   a) the boundaries mentioned in clause (1) (c)
   b) the location and type of each natural feature identified in relation to the project location, and
   c) the distance mentioned in clause (1) (d).
4. The dates and times of the beginning and completion of the site investigation.
5. The duration of the site investigation.
6. The weather conditions during the site investigation.
7. A summary of methods used to make observations for the purposes of the site investigation.
8. The name and qualifications of any person conducting the site investigation.

9. Field notes kept by the person conducting the site investigation.

This Natural Heritage Site Investigation Report has been organized and prepared to satisfy the conditions of the requirements outlined above.

3.0 Staff Roles

The requirements of the REA process indicate that the name and qualifications of all staff participating in the site investigation should be included. As a result, the qualifications and roles of key staff participating in the site investigation of the Bornish Wind Energy Centre have been outlined below.

Andrew G. Ryckman, B.Sc.
Andrew is a Terrestrial and Wetland Biologist with 7 years of environmental experience. He routinely manages the natural heritage aspects of renewable energy projects, with specific expertise relating to bats and herpetofauna. Andrew is certified in Ecological Land Classification (2010), and has successfully completed a Bat Conservation International (BCI) Acoustic Monitoring Workshop (2008).

Andrew's role in the Project was to act as the Project Manager, overseeing all aspects of the Natural Heritage Assessment, including all associated field work and reporting. He was the main contact point for agency staff and assisted with the preparation of all appropriate reports.

David E. Stephenson, M.Sc.
David specializes in natural resource inventories and evaluations, management, research and impact studies. He has managed hundreds of projects which have focused on the identification of important natural features and evaluation of the significance and sensitivity of these features. As a wetland specialist, David has worked extensively in wetland habitats throughout Ontario including the evaluation of over 150 wetlands using the standard Ontario Wetland Evaluation System (OWES). David has managed numerous studies focusing on development impacts on wetland ecology and functions and has developed solutions and recommendations for development proposals in and around wetlands, within the Wetlands Policy. David is OWES certified.

David's role in this project was to supervise the wetland boundary delineations and information collection within the project area.

Charlotte S. Moore, B.E.S.
Charlotte is a Terrestrial and Wetland Biologist with three field seasons of experience in butterfly ecology and various other environmental projects. Charlotte has completed her Bachelor of Environmental Studies and is a candidate for a Master of Environmental Studies (2013) at the University of Waterloo. Her Masters research will involve measuring the success of past restoration efforts using butterfly abundance and diversity in the riparian zones of several creeks. Other environmental projects Charlotte has worked on include the use of Ecological Land Classification (ELC), bat habitat assessments, breeding bird surveys and reptile studies.

Charlotte assisted with Ecological Land Classification (ELC) and was the main author for this report.

W. Graham Wright, B.E.S.
Graham is a former contract staff at NRSI and a recent graduate of the University of Waterloo with a Bachelor of Environmental Studies. He has a combined year of experience working both as a field technician and as an Information Officer working with protected areas and Species at Risk in Ontario. He has also participated in various terrestrial and aquatic environmental monitoring projects.

Graham helped complete ELC surveys and wildlife habitat assessments.

Heather L. Wright
Heather is a Field Biologist with experience in conducting vegetation inventories and reptile and mammal surveys. Heather graduated with a Bachelor of Environmental Studies from the University of Waterloo and completed a post-graduate certificate program in Ecosystem Restoration from Niagara College.

Her contributions to the project include assisting with Ecological Land Classification.

Kaitlin N. Powers, B.E.S
Kaitlin is a Terrestrial and Wetland Biologist with over 2 years experience working as an environmental technician in both public and private sectors. As a graduate in Environment and Resources Studies from the University of Waterloo, Kaitlin specialized her studies in ecological restoration and is a member of the Society for Ecological Restoration of Ontario (SERO). She is certified in Ecological Land Classification (ELC) for northeastern Ontario (2011).

Kaitlin assisted in completing ELC surveys and wildlife habitat assessments.

Katherine T. Clapham
Katherine is a former contract staff at NRSI with more than 2 years of experience working in the environmental field. During her consulting experience, Katherine has conducted aquatic, bat habitat and acoustic bat assessments throughout Ontario. Katherine is also certified in the OMNR Wetland Evaluation System (1993).

Katherine was responsible for identifying suitable bat habitat.

Patrick W. Deacon, B.E.S.
Patrick is a Terrestrial and Wetland Biologist with 4 years of environmental consulting experience. He regularly conducts vegetation inventories and community mapping, and specializes in ecological restoration with particular focus on Species At Risk, tallgrass prairie ecosystems, and invasive species management.

Patrick was responsible for identifying candidate bat habitats.

Nathan G. Miller, M.Sc.

Nathan graduated from the University of Guelph with a B.Sc. in Wildlife Biology and an M.Sc. in Integrative Biology. Research for Nathan's M.Sc. focused on the migration and conservation of the monarch butterfly throughout Canada and the United States. Nathan also has extensive experience conducting research on a wide range of wildlife species including birds, mammals, herptiles, insects and plants, which were acquired while working as a naturalist for the Ministry of Natural Resources in Algonquin Park and as an environmental consultant. Nathan is also certified in the Ecological Land Classification System for Northeastern Ontario (2011).

Nathan was responsible for completing Ecological Classification surveys within the project area.

Sophie A. Gibbs
Sophie is a former Terrestrial and Wetland Biologist with NRSI with over 2 years of practical work experience, both in a field and lab setting. She holds a keen interest in all aspect of natural history, but specializes in avian ecology and plant identification. With NRSI, Sophie routinely conducted ecological assessments, and collected field data on vegetation, birds, bats, amphibians, and reptiles in Ontario.

Sophie was involved in assisting with Ecological Land Classification surveys on several natural features within the project area.

Gerry Schaus, B.A., GIS-AS
Gerry has over 4 years of experience in the renewable energy sector and regularly does mapping for wind, solar and hydroelectric projects. This work includes mapping of natural features, vegetation communities, and aquatic habitats, terrestrial monitoring locations, constraints and proposed turbine layouts. Gerry has also completed a number of receptor surveys for proposed wind projects using Trimble GPS and a laser offset to accurately gather building points without ever needing to step on private property. Additionally, Gerry has significant experience working with AutoCAD and (AutoCAD) Map3D. This expertise allows for the easy integration of CAD plans with GIS layers or vice versa.

Gerry's role in the Project was as GIS technician and map creation. He reviewed and collected all available background mapping resources to compile into Project mapping.

4.0 Summary of Records Review

In accordance with the REA Regulation, an area of at least 120 m beyond the project location was examined for natural heritage features, including Areas of Natural and Scientific Interest (ANSI), wetlands, woodlands, valleylands, and wildlife habitat. Numerous agencies were contacted to compile a comprehensive records review, including the Aylmer District Ministry of Natural Resources (MNR) and Ausable Bayfield Conservation Authority. NRSI also utilized numerous background review sources, such as the Natural Heritage Information Centre's Biodiversity Explorer, Ontario Breeding Bird Atlas (OBBA), Ontario Herpetofauna Atlas, and the Atlas of the Mammals of Ontario. The comprehensive results of the records review have been summarized in Table 1 below.

Table 1. Summary of Records Reviewed for the Bornish Wind Energy Centre

Criteria	Result
1. Within 120m of a Provincial Park or Conservation Reserve	The Bornish Wind Energy Centre is not located within 120 m of a Provincial Park or Conservation Reserve.
2. In a Natural Feature	The results of this records review indicate that project components (i.e. disturbance area, cabling, access roads etc.) of the Bornish Wind Energy Centre overlap with 9 woodlands. Based on review of air photos, these woodlands are expected to consist of deciduous forest with vegetation associations that are representative of this region of southwestern Ontario. The extent to which project locations overlap with natural areas is variable and will be further examined and addressed in the site investigation phase of the project.
3. Within 50m of a ANSI-ES	No ANSI-ES is located within 50m of the project location
4. Within 120m of a Natural Feature	
a) ANSI-LS	No ANSI-LS is located within 120m of the project location.
b) Coastal Wetland	No coastal wetlands are located within 120m of the project location.
c) Northern Wetland	No northern wetlands are found within 120m of the project location.
d) Southern Wetland	Three southern wetlands within designated Environmentally Significant Areas have been identified within 120m of the project location. Wetlands may also be located within woodland boundaries.
e) Valleyland	No known valleylands are located within 120m of the project location.
f) Wildlife Habitat	40 woodlands are located within 120m of the project location which could potentially provide several types of Significant Wildlife Habitat (SWH). Other natural features such as naturalized drainage ditches

	and hedgerows have been identified within 120 m of the project location and could also provide SWH. These features will be surveyed to determine if they are used as animal movement corridors or provide habitat for species of conservation concern. Several species of conservation concern were identified as potentially occurring within the Bornish project area. Candidate habitats for these species will be investigated for potential Significant Wildlife Habitat. All of these wildlife habitats should be examined during the site investigation phase and/or the evaluation of significance phase of this project to identify other habitat features and identify the significance of each natural feature.
g) Woodland	40 woodlands are located within 120m of the project location, including 9 that may overlap with the project location. Basemapping indicate these wooded areas range in size from <1 ha to 137.2 ha. These woodlands are expected to be primarily dominated by mid-aged to mature deciduous tree species; however woodlands, treed plantations, or occasional coniferous woodlands may also be present within 120 m of the project location.

The results of the records review of wildlife habitat are provided in Table 2. This table summarizes the presence of the full range of potential wildlife habitats within the project area. The purpose of this table is to guide the site investigation, to further refine the types of wildlife habitats that have the potential to occur within the project area. Wildlife habitats that have been confirmed to be either not applicable to the project area or known to not occur within the project area, based on criteria set out by the Ministry of Natural Resources (OMNR 2000; 2011a), will not be discussed in future Natural Heritage Assessment reports for the Bornish Wind Energy Centre.

Table 2. Summary of Significant Wildlife Habitats Identified during the Records Review

Wildlife Habitat Type	Present Within 120m of Project Location	Present Within Project Location	Site Investigation Required (Y/N)
Seasonal Concentration Areas			
Winter Deer Yards	No	No	**No**
Colonial-Nesting Bird Breeding Habitat (swallows)	Unknown	Unknown	**Yes**
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	Unknown	Unknown	**Yes**
Colonial-Nesting Bird Breeding Habitat (ground)	Unknown	Unknown	**Yes**

Wildlife Habitat Type	Present Within 120m of Project Location	Present Within Project Location	Site Investigation Required (Y/N)
Waterfowl Stopover and Staging Areas (terrestrial)	Unknown	Unknown	**Yes**
Waterfowl Stopover and Staging Areas (aquatic)	Unknown	Unknown	**Yes**
Waterfowl Nesting Habitat	Unknown	Unknown	**Yes**
Shorebird Migratory Stopover Areas	N/A	N/A	**No**
Landbird (including songbird) Migratory Stopover Areas	N/A	N/A	**No**
Raptor Winter Feeding and Roosting Areas	Unknown	Unknown	**Yes**
Wild Turkey Winter Range	N/A	N/A	**No**
Turkey Vulture Summer Roosting Areas	N/A	N/A	**No**
Reptile Hibernacula (snakes)	Unknown	Unknown	**Yes**
Bat Hibernacula	Unknown	Unknown	**Yes**
Bat Maternity Colonies	Unknown	Unknown	**Yes**
Amphibian Breeding Habitat (woodland)	Unknown	Unknown	**Yes**
Amphibian Breeding Habitat (wetland)	Unknown	Unknown	**Yes**
Migratory Butterfly Stopover Areas	N/A	N/A	**No**
Rare Vegetation Communities and Specialized Wildlife Habitat			
Alvars	Unknown	Unknown	**Yes**
Tall-grass Prairies	Unknown	Unknown	**Yes**
Savannahs	Unknown	Unknown	**Yes**
Rare Forest Types	Unknown	Unknown	**Yes**
Talus Slopes	Unknown	Unknown	**Yes**
Rock Barrens	Unknown	Unknown	**Yes**
Sand Barrens	Unknown	Unknown	**Yes**
Great Lakes Dunes	N/A	N/A	**No**
Forests Providing High Diversity of Habitats	N/A	N/A	**No**
Old-growth or Mature Forest Stands	Unknown	Unknown	**Yes**
Foraging Areas with Abundant Mast	N/A	N/A	**No**
Turtle Nesting Habitat	Unknown	Unknown	**Yes**
Turtle-Over-wintering Habitat	Unknown	Unknown	**Yes**
Woodland Raptor Nesting Habitat	Unknown	Unknown	**Yes**
Osprey Nesting/Bald Eagle, Foraging, and Perching Habitat	Unknown	Unknown	**Yes**
Moose Calving Areas	N/A	N/A	**No**
Moose Aquatic Feeding Zone	N/A	N/A	**No**
Mineral Licks	N/A	N/A	**No**
Mink, Otter, Marten, and Fisher Denning Sites	Unknown	Unknown	**Yes (Mink only)**
Highly Diverse Areas	N/A	N/A	**No**
Cliffs	No	No	**No**
Seeps and Springs	Unknown	Unknown	**Yes**
Amphibian Movement Corridors	Unknown	Unknown	**Yes**

Wildlife Habitat Type	Present Within 120m of Project Location	Present Within Project Location	Site Investigation Required (Y/N)
Habitats of Species of Conservation Concern			
Marsh Bird Breeding Habitat	Unknown	Unknown	**Yes**
Woodland Area Sensitive Breeding Birds	Unknown	Unknown	**Yes**
Open Country Breeding Bird Habitat	Unknown	Unknown	**Yes**
Shrub/Early Successional Bird Breeding Habitat	Unknown	Unknown	**Yes**
Terrestrial Crayfish	Unknown	Unknown	**Yes**
Habitat for Special Concern Species	Unknown	Unknown	**Yes**
Habitat for S1-S3, and SH (Possibly Extirpated Historically) Species and Communities	Unknown	Unknown	**Yes**

5.0 Site Investigation Methodology

Comprehensive site investigations to document the environmental and biological characteristics of the Bornish Wind Energy Centre were undertaken in accordance with the REA Regulation and the requirements of the MNR. These site-specific field investigations focused on vegetation community mapping to support, and build on the information collected during the records review phase of this project. The results of these site investigations will be used to identify and map the boundaries of the natural features within 120m of the project location and identify candidate significant wildlife habitats. Information collected at this stage will be used to evaluate the significance of features in a subsequent report.

5.1 Survey Dates

In accordance with the REA Regulation, NRSI recorded dates, times, duration, and weather conditions during each site investigation. This information has been summarized below in Table 3. Detailed descriptions of staff roles and qualifications can be found in Section 3.0 of this report, and detailed field forms have been appended to this report.

Table 3. Site Investigation Survey Dates

Staff Name(s)	Purpose	Date (2011)	Start Time (hrs)	Duration (hrs)	Weather Conditions		
					Temp. (℃)	Beaufort Wind	Cloud Cover (%)
Patrick W. Deacon, Katherine P. Clapham	Candidate Wildlife Habitat Assessment	June 20	900	5.25	21.5	Unknown	Unknown
Patrick W. Deacon, Katherine P. Clapham	Candidate Wildlife Habitat Assessment	June 21	1000	5.5	23.3	Unknown	Unknown
Patrick W. Deacon, Katherine P. Clapham	Candidate Wildlife Habitat Assessment	June 22	900	7.25	21.8	Unknown	Unknown
Patrick W. Deacon, Katherine P. Clapham	Candidate Wildlife Habitat Assessment	June 23	1000	6.5	20.5	Unknown	Unknown
Charlotte S. Moore, Kaitlin N. Powers	ELC and Candidate Wildlife Habitat Assessment	August 19	1015	1.75	23.0	1	0
Jessica R. Walker, Kaitlin N. Powers	ELC and Candidate Wildlife Habitat Assessment	August 24	900	6.5	24.0	3	50
Jessica R. Walker, Kaitlin N. Powers	ELC and Candidate Wildlife Habitat Assessment	August 25	930	0.5	20.0	4	60
Jessica R. Walker, Kaitlin N. Powers	ELC and Candidate Wildlife Habitat Assessment	August 26	900	5.25	23.0	2	15
Nathan G. Miller, Sophie A. Gibbs	ELC and Candidate Wildlife Habitat Assessment	September 19	1500	0.5	19.0	2	100
Kaitlin N. Powers, Heather L. Wright	ELC and Candidate Wildlife Habitat Assessment	September 26	1300	3.75	19.0	3	100
Kaitlin N. Powers, Heather L. Wright	ELC and Candidate Wildlife Habitat Assessment	September 27	1645	0.5	21.0	2	50
Kaitlin N. Powers,	ELC and Candidate	September	845	4.75	20.0	3	90

Staff Name(s)	Purpose	Date (2011)	Start Time (hrs)	Duration (hrs)	Weather Conditions		
					Temp. (℃)	Beaufort Wind	Cloud Cover (%)
Heather L. Wright	Wildlife Habitat Assessment	28					
William G. Wright, Kaitlin N. Powers	ELC and Candidate Wildlife Habitat Assessment	October 5	1230	4.75	20.0	2	5
William G. Wright, Mitch E. Ellah	ELC and Candidate Wildlife Habitat Assessment	October 7	1145	1.25	21.5	0	0
William G. Wright, Heather L. Wright	ELC and Candidate Wildlife Habitat Assessment	October 12	915	1.5	19.0	3	100
William G. Wright, Heather L. Wright	ELC and Candidate Wildlife Habitat Assessment	October 13	1230	1.0	15.0	1	100
William G. Wright, Mitchell E. Ellah	ELC and Candidate Wildlife Habitat Assessment	October 27	1645	0.5	7.0	2	10
Charlotte S. Moore Jessica S. Pang	ELC and Candidate Wildlife Habitat Assessment	November 17	1115	4.75	3.0	2	60
Charlotte S. Moore Kaitlin N. Powers	ELC and Candidate Wildlife Habitat Assessment	December 2	1230	4.0	1.0	3	70

5.2 Designated Natural Areas

Natural areas, including provincial parks, conservation reserves, and Areas of Natural and Scientific Interest are identified and confirmed by regulatory agencies. None of these features are present within 120 m of the Bornish project location and are not discussed further in this report.

5.3 Woodlands

Woodlands, as identified by the Natural Heritage Assessment Guide (OMNR 2011c), are defined as being 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*".

According to Lee et al.1998, any treed communities with >60% canopy cover are considered to be 'forests', treed communities with 35-60% canopy cover are considered to be 'woodlands', and tree communities with 11-35% canopy cover are considered 'savannahs.' For the purposes of this NHA report, all of these communities are considered woodland features as defined in the NHA guidance document. To identify and characterize woodlands within the project area, NRSI biologists have conducted Ecological Land Classification (ELC) mapping of all vegetation communities into polygons during site investigation and through visual observation of vegetation communities. These observations were compared to available aerial photography to finalize boundaries. Although some vegetation characteristics were obtained from natural area reports and Environmentally Significant Area mapping was reviewed from the Ausable Bayfield Conservation Authority, no previous ELC mapping was available or used during these surveys. Surveys included walking area searches of the habitat in each polygon where access was granted, in order to compile a comprehensive vegetation inventory. Woodland boundaries were confirmed through the use of site-specific investigations, with actual delineations made using the dripline based on aerial photography interpretation. In instances where the site investigation confirmed changes to the available basemapping or aerial photography, other land forms or specific GPS points were used to aid in the accurate determination of the new dripline. Woodland site investigations documented the following: community classification, substrate, topographic features, plant form, canopy cover, size class analysis, snags, deadfall/logs,

community age and domination of vegetation within the canopy, sub-canopy, understory and groundcover. Substrate sampling (soil augering) was determined unnecessary for the identification of woodlands, but was used for the identification of wetlands, and is discussed in more detail below. Several vegetation communities contain inclusions and complexes. Inclusions contain distinct communities that are found within a polygon but are too small to be visible on air photos, while complexes occur where site and vegetation conditions are variable and represent two or more communities intermixed that are too complex to map (Lee et al. 1998). Candidate significant wildlife habitat assessments were also completed within each ELC polygon, which are outlined below in Section 5.6. This ELC mapping was completed using the proposed 2008 draft revisions to the original ELC manual, referred to as the second approximation of ELC codes.

For properties where site-specific access could not be obtained, NRSI biologists conducted ELC mapping from the closest observable point (i.e. roadside, neighbouring property, etc.) and compared this to a detailed review of aerial photographs to characterize the polygon to the lowest level possible.

The completed ELC mapping is provided in Figures 3 to 7 and field notes and maps can be found in Appendix I.

5.4 Wetlands

Wetlands include habitats that are seasonally or permanently covered by shallow water and display the presence of specific soil types and vegetation communities (OMNR 2011c). Preliminary wetland identifications were made through the implementation of ELC mapping to identify lowland forests, wetlands, or other habitat types that may function as wetlands (reference ELC methods in section 5.2).

In addition to the detailed ELC methods described above, soil sampling (augering) was also conducted in suspect wetlands to confirm the moisture regime and vegetation inventories were used to identify the presence and abundance of wetland indicator species. These habitats were then compared to the Ontario Wetland Evaluation System (OWES) manual to confirm their wetland status. Any communities identified as wetlands were delineated using site-specific field investigations combined with the use of detailed

aerial photography. The delineated wetland boundary and field notes were reviewed by OWES-certified staff.

In potential wetlands where site access or right-of-entry could not be obtained, NRSI biologists conducted ELC mapping to the highest level possible from the nearest observation point, such as roadside or property boundary. The limitations of this alternative method are that detailed habitat or substrate information are not easily determined, and could not be properly assessed. In these instances where borderline wetlands are present, assuming no direct overlap with project location, NRSI has assumed these features to be wetlands in absence of appropriate habitat characteristics. Instances where site access could not be obtained are clearly identified on the completed field data forms that have been included in Appendix I of this report.

5.5 Valleylands

In accordance with the Natural Heritage Assessment Guide (OMNR 2011c), valleylands are considered to occur in a valley or other depression, with flowing or standing water present for a portion of the year. The identification of these features is largely based on geomorphology and aquatic resources. The Ausable Bayfield Conservation Authority was consulted during the records review phase of the project to determine whether valleylands are present within the project area. The conservation authority did not identify any valleylands within the project area. Nonetheless, the presence of valleylands was examined during the site investigation phase in order to confirm their absence from the project area. Valleyland boundaries were delineated on field maps using the site-specifc top of bank, as observed during the site investigation. While converting these boundaries to digital files, the available contour layer was also overlaid to further refine the limits of top-of-bank. In some instances, where applicable, observed vegetation boundary or available hazard limit mapping was also used to guide the delineation of valleyland boundaries.

5.6 Wildlife Habitat

The identification of wildlife habitat within the project area uses the definitions provided in the Natural Heritage Assessment Guide (OMNR 2011b) and Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000), which generally includes areas where

plants and animals live, with adequate food, water, shelter, and space to sustain their populations (OMNR 2011b).

Candidate wildlife habitat assessments took place during ELC surveys so that as vegetation communities were delineated, surveys could be conducted for wildlife habitat features that are associated with the identified vegetation community. These surveys were undertaken through areas searches for habitat features and through recording wildlife observations (i.e. visual sightings, vocalizations, tracks etc.) of specific species. Habitat features for which area searches were performed include, but are not limited to: nests, snags, fallen logs, tree cavities, cliffs/banks, caves, burrows, dens, rock piles/stone walls, organics piles, karst, old foundations, vernal pools/woodland ponds, sand, fine sandy gravel, as well as crayfish chimneys. All preliminary candidate wildlife habitat assessments were conducted between June 20, 2011 and December 2, 2011. Sites that were identified as requiring further study were revisited during a time of year appropriate for the specific type of wildlife habitat being assessed.

For the purposes of the Natural Heritage Assessment reports, NRSI has separated the discussion on wildlife habitat into the 4 broad habitat categories, including seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. Each of these broad habitat types has been described in more detail in the following sections, and field notes for each have been provided in Appendix I of this report.

5.6.1 Seasonal Concentration Areas

Wildlife seasonal concentration areas are defined as areas where animals occur in relatively high densities for all, or portions, or their life cycle (OMNR 2011b). These areas are generally relatively small in size, particularly when compared to areas used by these species during other times of the year. Habitats of seasonal concentrations of animals have been identified by using the habitat criteria found in the SWHTG and Significant Wildlife Habitat: Ecoregion Criteria Schedules (OMNR 20011a). The habitat criteria for each potential seasonal concentration area have been summarized in Table 4 below.

Table 4. General Characteristics Used to Identify Candidate Seasonal Concentration Areas

Candidate Seasonal Concentration Area	Habitat Criteria	Site Investigation Methods
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	• Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (ME), Thicket (TH), Savannah (SV), Bluff (BL), Cliff (CL)[1]. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[1]. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation • Relative importance of the site to local bird populations[3] • Quality of habitat[3] • Size of site[3] • Level of disturbance[3] • Historical use[3] • Potential concerns of the planning authority[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • During area searches associated with ELC mapping, NRSI biologists also assessed the presence of colonially-nesting bird species within suitable ELC communities.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	• Any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Coniferous Treed Fen (FETC1)[1]. • The edge of the colony and a minimum 300m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[1]. • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. • Relative importance of the site to local bird populations[3] • Quality of habitat[3] • Size of site[3] • Level of disturbance[3] • Historical use[3] • Potential concerns of the planning authority[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Colonial-Nesting Bird Breeding Habitat (Ground)	• Any rocky island or peninsula within a lake or large river, close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Meadow (ME), Thicket (TH), Savannah (SV)[1]. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[1]. • Relative importance of the site to local bird	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • During area searches associated with ELC mapping, NRSI biologists also assessed the presence of colonially-

	populations[3] • Quality of habitat[3] • Size of site[3] • Level of disturbance[3] • Historical use[3] • Potential concerns of the planning authority[3]	nesting bird species within suitable ELC communities.
Waterfowl Stopover and Staging Area (Terrestrial)	• Fields with sheet water during Spring (mid-March to May) or annual spring melt water flooding found in any of the following Community Types: Meadow (ME), Thicket (TH)[1]. • A 100-300m radius buffer around habitat has been considered the candidate SWH[1]. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless used by Tundra Swans in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas. • Relative importance of the site to local waterfowl populations[3] • Quality of habitat[3] • Size of site[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • Initial surveys were conducted in late May to gather information on seasonal flooding of suitable fields. • Background information on waterfowl use within the project area has also been used to guide the identification of suitable habitat for waterfowl stopover and staging within the project.
Waterfowl Stopover and Staging Area (Aquatic)	• The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD)[1]. • The combined area of the ELC ecosites and a 100m radius area is the SWH[1]. • Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • Relative importance of the site to local waterfowl populations[3] • Quality of habitat[3] • Size of site[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Waterfowl Nesting Area	• Upland habitats of any kind located adjacent to (≤120m) any PSW or the following wetland Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Bedrock Thicket (RBS), Mineral Thicket Swamp (SWT), or Mineral Deciduous Swamp (SWD)[1]. • Wetland is >0.5ha or cluster of 3 or more smaller wetlands within 120m of each other where waterfowl nesting occurs[1]. • Upland areas should be at least 120m wide[1]. • Relative importance of the site to local waterfowl populations[3] • Size of area[3] • Quality of habitat[3] • Location of site[3] • Level of disturbance[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • Proximity of undisturbed upland habitat to wetland habitat, and determination of wetland size have been confirmed through GIS mapping. • Land use should be conducive to upland nesting waterfowl during May, June and into July.
Raptor Winter Feeding and Roosting Areas	• Presence of fields and woodlands. I.e. at least one of the following Community Types: Forest (FO), Treed Swamp (SWD, SWM, SWC), in addition to one of the following Community Types: Meadow (ME), Thicket (TH), Savannah (SV), Woodland	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project

	(WO) (<60% cover) that are >20ha and provide roosting, foraging and resting habitats for wintering raptors[1]. • Upland habitat (ME, TH, SV, or WO), must represent at least 15ha of the 20ha minimum size. • Relative importance of the site[3] • Size of site[3] • Level of disturbance[3] • Location of site[3] • Habitat quality[3] • Historical use of area[3]	area. • Habitat size has been determined using GIS mapping.
Bald Eagle winter feeding and roosting areas	• Relative importance of the site • Size of site • Habitat quality • Level of disturbance • Location of roost • Historical use of area	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Reptile Hibernacula (Snakes)	• Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock, wetlands such as conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover[1]. • Any ecosite in central Ontario other than very wet ones, The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1)[1]. • The feature in which the hibernacula is located plus a 30 m buffer is the SWH[1]. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. • Relative importance of the site[3] • Habitat quality[3] • Location of site[3] • Level of disturbance[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • During area searches associated with ELC mapping, NRSI biologists documented any potential hibernation sites that may provide habitat below the frost line.
Bat Hibernacula	• Caves, mine shafts, underground foundations, Karsts or one of the following Community Types: Crevice (CCR), Cave (CCA)[1]. • The area includes 1000m radius around the entrance of the hibernaculum[1]. • Does not include buildings[1]. • Relative importance of the site[3] • Habitat quality[3] • Location of site[3] • Level of disturbance[3]	• Known sites Identified by OMNR and based on topography. • Potential sites based on MNDM abandoned mines locations • Potential sites based on karst topography
Bat Maternity Colonies	• Any of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM), Deciduous Treed Swamp (SWD), Mixed Treed Swamp (SWM) that have >25cm diameter at breast height (dbh) wildlife trees[1]. • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH)[1]. • Maternity roosts are not found in caves and mines	• For habitats surveyed pre-July 2011 (before snag densities was established as a criteria), NRSI biologists conducted area searches within each woodland to look for suitable snags. Original criteria used by NRSI biologists to identify

	in Ontario[1]. • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[1] • If snag/ cavity tree density is ≥10 snags per hectare of trees ≥25 cm dbh, then the site is a candidate for maternity colony roosts • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred	suitable habitats included large snags (>20cm dbh) with obvious cracks, cavities, or crevices that would be deemed suitable size for a maternal colony. • For features that were sampled after July 2011, snag-density was calculated by randomly selecting plots within a candidate natural feature. Ten plots were selected for natural features ≤10ha, with one plot being added for each hectare over 10ha to a maximum of 30 plots. These sampling plots were 12.6m radius (0.05ha) plots. The number of snags/cavity trees ≥25cm dbh were counted in each plot. The snag density of these plots was then extrapolated to the natural feature.

[1]: OMNR Significant Wildlife Habitat Ecoregion 7E Criterion Schedule: Addendum to SWHTG (Working Draft) (2011a)
[2]: OMNR Significant Wildlife Habitat Technical Guide (2000)
[3]: OMNR Significant Wildlife Habitat Technical Guide Appendix Q (2000)

5.6.2 Rare Vegetation Communities and Specialized Wildlife Habitat

Rare vegetation communities are areas that contain a provincially rare vegetation community and/or areas that contain a vegetation community that is rare within the planning area (OMNR 2000). Specialized wildlife habitats are considered to be: areas that support wildlife species that have highly specific habitat requirements; areas with exceptionally high species diversity or community diversity; areas that provide habitat that greatly enhances a species survival (OMNR 2000).

Rare vegetation communities and specialized wildlife habitat have been identified in the Bornish Wind Energy Centre by using the habitat criteria found in the SWHTG and Significant Wildlife Habitat: Ecoregion Criteria Schedules (OMNR 2011a). The habitat criteria for rare vegetation communities and specialized wildlife habitat have been summarized in Table 5 below.

Table 5. General Characteristics Used to Identify Rare Vegetation Communities and Candidate Specialized Wildlife Habitats

Candidate Specialized Wildlife Habitat	Habitat Criteria	Site Investigation Methods
Alvars	• Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry Pine Calcareous Shallow Coniferous Forest Ecosite), FOC2 (Dry Cedar Calcareous Shallow Coniferous Forest Ecosite), CUM2 (Bedrock Cultural Meadow Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite), CUT2-1 (Common Juniper Cultural Alvar Thicket Type), CUW2 (Bedrock Cultural Woodland Ecosite) that are >0.5ha in size[1]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[1]. • Alvar is particularly rare in ecoregion 7E where the only known sites are found in the western islands of Lake Erie • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Tall-grass Prairies	• Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite). • These communities must be restored or natural[1]. • Area of the ELC Ecosite is the SWH[1]. • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Savannahs	• Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savanna Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savanna Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite). • These communities must be restored or natural[1]. • Area of the ELC Ecosite is the SWH[1]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[1]. • In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.

	Brantford and in the Toronto area (north of Lake Ontario). • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	
Rare Forest Types	• Woodlands with >60% forest cover, containing regionally/locally or provincially rare tree species or tree associations. • Rare forest types are listed in Appendix J and M of the SWHTG[2]. • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Talus Slopes	• Any of the following Community Types: TAO (Open Talus), TAS (Shrub Talus), TAT (Treed Talus)[1]. • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Rock Barrens	• Open to moderately-treed sites (up to 60% crown coverage), characterized by exposed bedrock and very shallow soils (less than 15 cm). • Found on limestone plains adjacent to the Precambrian Shield[2]. • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Sand Barrens	• Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite)[1]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[1]. • Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%. • No minimum size for sand barren area • Current representation of community type within the planning area[3] • Condition of community[3] • Size and location of site[3] • Potential for long-term protection of the site[3] • Provision of significant wildlife habitat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Old-growth or Mature	• Stands ≥30ha or with ≥10ha interior habitat in	• Habitat identification

Forest Stands	any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest)[1]. • If dominant trees species of the ecosite are >140 years old, then stand is SWH[1]. • The area of Forest Ecosites combined to make up the stand is the SWH[1]. • The stand will have experienced no recognizable forestry activities[1]. • No minimum size to site • Forests with a wide range of tree sizes, uneven canopy and canopy gaps, abundant fallen logs in varying states of decomposition, trees in older age classes (often 120-140yrs+)[2]. • Current representation of old growth or mature forest stands within the planning area[3] • Age of trees[3] • Age classes of trees in stand[3] • Presence of old growth characteristics[3] • Provision of SWH[3] • Potential for long-term protection of site[3] • Stand history[3] • Size and location of site[3] • Degree of disturbance[3]	occurred through the detailed ELC mapping that was conducted throughout the project area. • Habitat size and extent of interior habitat were determined using GIS mapping.
Turtle Nesting Habitat	• Exposed mineral soil (sand or gravel) areas <100m from or within the following Community Types: Any of the following Community Types: Mineral or Organic Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO)[1]. • A radius of 30-100m around the nesting area has been considered the candidate SWH[1]. • Travel routes from wetland to nesting area are to be considered within the SWH[1]. • Size of habitat[3] • Location of site[3] • Substrate[3] • Level of predation[3] • Presence of movement corridor [3] • Degree of disturbance[3] • Degree of threat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Turtle-Over-wintering Habitat	• Over-wintering areas are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen, and generally utilize the same habitat as their core habitat. • These habitats are found in the following Community Types: Swamp (SW), Marsh (MA), Open Water (OA), Shallow Water (SA), Open Fen (FEO), Open Bog (BOO)[1]. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH[1].	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Woodland Raptor Nesting Habitat	• Any of the following Community Types: Forest (FO), Treed Swamp (SW), Coniferous Plantation (TAGM1) that are >30ha with 10ha of interior habitat[1].	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout

	• Presence of 1 or more active nests from species list is considered significant[1]. • May also be found in SWC, SWM, SWD and CUP3	the project area. • Habitat size, interior habitat, and edge buffer were all determined through GIS mapping. • During ELS mapping, the presence of stick nests within suitable habitats was also documented.
Osprey Nesting, Foraging, and Perching Habitat	• Any of the following Community Types: Forest (FO), or Swamp (SW) that are immediately adjacent to rivers, lakes, ponds, and wetlands. • Nests may be located in dead trees over water along forested shorelines, islands or structures. • Nests on man-made objects are not SWH[1]. • Access to foraging areas[3] • Presence of large, sturdy trees near shoreline[3] • Degree of disturbance[3] • Current representation of potential sites[3] • Degree of threat[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • During area searches of this habitat, NRSI biologists looked for large, suitable, trees, or the presence of stick nests within suitable treed habitats.
Mink Denning Sites	• Shorelines with coniferous or mixed forest. • Presence of suitable habitat[3] • Degree of disturbance[3] • Size of local fish population[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Amphibian Breeding Habitat (Woodland)	• Any of the following Community Types: Forests (FO), Treed Swamps (SW), in addition to wetlands/lakes/ponds found within or adjacent to (<120m) the woodland[1]. • The habitat is the woodland (ELC polygons) and wetland (ELC polygons) combined[1]. • Provision of significant wildlife habitat[3] • Degree of permanence[3] • Size and number of ponds[3] • Diversity of submergent and emergent vegetation[3] • Presence of shrubs, logs at edge of pond[3] • Adjacent forest habitat[3] • Water quality[3] • Level of disturbance[3]	• Area searches for suitable habitat, conducted during ELC mapping. • Since ELC mapping was not conducted during a time period that can be related to the presence of vernal pooling, NRSI biologists assessed the potential for vernal pooling by examining topography, observed hydrology, vegetation species, and other habitat characteristics to assess the potential for seasonal pooling of water for amphibian breeding. • Proximity to other features was determined through GIS mapping.
Amphibian Breeding Habitat (Wetland)	• Any of the following Community Types: Swamp (SW), Marsh (MA), Fen (FE), Bog (BO), Open Water (OA), Shallow Aquatic (SA), including vernal pools, that are >500m2 or 25m in diameter, and located >120m from woodlands[1]. • The ELC ecosite wetland area and the shoreline are the SWH[1].	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • Habitat size and proximity to other habitats were determined through GIS mapping.
Seeps and Springs	• Locations where groundwater comes to	• Habitat identification

	surface, often in forested headwater areas. • Any forested area (with <25% meadow, field, or pasture) within the headwaters of a stream or river system may have seeps or springs[1]. • The area of an ELC forest ecosite containing the seeps/springs is the SWH[1]. • Presence of a site with 2 or more seeps/springs should be considered SWH[1]. • Abundance of seeps/springs[3] • Duration of surface water[3] • Nature of adjacent area[3] • Location of seeps/springs[3]	occurred through the detailed ELC mapping that was conducted throughout the project area.

[1]: OMNR Significant Wildlife Habitat Ecoregion 7E Criterion Schedule: Addendum to SWHTG (Working Draft) (2011a)
[2]: OMNR Significant Wildlife Habitat Technical Guide (2000)
[3]: OMNR Significant Wildlife Habitat Technical Guide Appendix Q (2000)

5.6.3 Habitats of Species of Conservation Concern

Habitats of species of conservation concern are those habitats that have been identified as important in maintaining long-term, viable populations of these species. The habitat characteristics for species of conservation concern have been summarized in Table 6 below, while individual criteria for species of conservation concern are found in Table 7. The presence of these habitat characteristics was investigated during project area surveys in order to determine whether habitat for species of conservation concern is present within 120 m of the project location.

Table 6. General Characteristics Used to Identify Candidate Habitats for Species of Conservation Concern

Candidate Habitat for Species of Conservation Concern	Habitat Criteria	Site Investigation Methods
Marsh Bird Breeding Habitat	• All wetland habitats with shallow water and emergent aquatic vegetation. • May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: SW (Swamp), MA (Marsh) and Meadow (ME) Community Types[1]. • Condition of existing habitat at site[3] • Size and location of habitat[3] • Potential for long-term protection of the habitat[3] • Representation of species/habitat within the municipality[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • During ELC mapping and area searches, NRSI biologists documented the presence of any potential nesting locations.
Woodland Area-sensitive Bird Breeding Habitat	• Habitats where interior forest (at least 200m from the forest edge) breeding birds are breeding. • These include any of the following Community Types: Forest (FO), Treed Swamp (SW) that are mature (>60 years old) and >30ha with >4ha of interior habitat[1]. • Condition of existing habitat at site[3] • Size and location of habitat[3] • Potential for long-term protection of the habitat[3] • Representation of species/habitat within the municipality[3]	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • Woodland size and interior forest calculations were determined through GIS mapping.
Open Country Bird Breeding Habitat	• Grassland areas > 30ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (ME)[1].	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area. • Habitat size was determined through GIS mapping. • Landowners were consulted where

	• Condition of existing habitat at site[3] • Size and location of habitat[3] • Potential for long-term protection of the habitat[3] • Representation of species/habitat within the municipality[3]	there were any questions regarding past land use of these fields.
Shrub/Early Successional Bird Breeding Habitat	• Oldfield areas succeeding to shrub and thicket habitats (for Golden Winged Warblers >10ha; other species have no minimum area requirement), not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (TH), Savannahs (SV)[1]. • Condition of existing habitat at site[3] • Size and location of habitat[3] • Potential for long-term protection of the habitat[3] • Representation of species/habitat within the municipality[3] • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands[1].	• Habitat identification occurred through the detailed ELC mapping that was conducted throughout the project area.
Terrestrial Crayfish	• Area of ELC Ecosite polygon is the SWH[1] • MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3[1] • Meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish[1] • Species whose range is solely or primarily found in Ontario (i.e., provincial responsibility)[3] • Condition of existing habitat at site[3] • Size and location of habitat[3] • Potential for long-term protection of the habitat[3] • Representation of species/habitat within the municipality[3] • Evidence of use of the habitat[3] • Species of particular interest to the planning authority (e.g., the CAC may recommend certain species such as indicator species)[3]	• Area searches occurred within suitable habitats (MAM and MAS) to look for terrestrial crayfish and chimneys. • These surveys were conducted during ELC mapping.
S1-S3, Special Concern and SH Species and Communities	• All Species Concern or provincial rare plant and animal species element occurrences within a 1 or 10km grid[1]. • Condition of existing habitat at site[3] • Size and location of habitat[3] • Potential for long-term protection of the habitat[3] • Representation of species/habitat within the municipality[3]	• Area searches to determine candidate habitat for any identified species or communities, conducted during ELC mapping.

[1]: OMNR Significant Wildlife Habitat Ecoregion 7E Criterion Schedule: Addendum to SWHTG (Working Draft) (2011a)

[2]: OMNR Significant Wildlife Habitat Technical Guide (2000)
[3]: OMNR Significant Wildlife Habitat Technical Guide Appendix Q (2000)

Table 7. Criteria for Species of Conservation Concern Identified Near the Bornish Wind Energy Centre Project Area

Species	Habitat Criteria	Survey Methodology
Birds		
Red-headed Woodpecker	• Open woodland and woodland edges, especially in oak savannahs and riparian forest • Can be found in fields or pastures, orchards and small woodlots (OMNR 2000) • Habitats contain a higher density of dead trees, which they commonly use for nesting and perching (OMNR 2008a) • Require a tree with a diameter at breast height of at least 40 cm for tree cavity nesting and require around 4 ha for territory (OMNR 2000)	• Area searches within suitable habitat (ELC codes: FO/WO/ME/SW/AG) for red-headed woodpecker were conducted in conjunction with ELC mapping, with snag size class analysis documented on ELC data sheets. • Based on the generalist nature of this species, specific breeding habitat for this species is often difficult to identify. This species will be considered when development is proposed within woodland edges; otherwise it will not be delineated.
Golden-winged Warbler	• Early successional habitat such as shrubby grassy abandoned fields, small deciduous trees bordered by low woodland or swamp (OMNR 2000) • Also may be found in field edges, hydro or utility right of ways or recently logged areas • Require more than 10 ha of continuous habitat (OMNR 2000)	• ELC mapping to determine if candidate habitat is present. • Area searches within suitable habitat (ELC codes: FO/WO/ME/TH) for golden-winged warbler were conducted in conjunction with ELC mapping. • Habitat for this species is covered under the consideration of Shrub/Early Successional Bird Breeding Habitat.
Herpetofauna		
Common Snapping Turtle	• Permanent or semi-permanent fresh water marshes, swamps, bogs or rivers and streams with soft muddy bottoms • Soft soil or clean, dry sand are used for nesting. May use man-made structures such as gravel road shoulders (OMNR 2009) • Home range of 38 ha is required	• Habitat for this species has been determined through the consideration of Turtle Nesting and Over-wintering Habitat.
Eastern Milksnake	• Farmlands, meadows, hardwood or aspen stands, pine forests with brushy or woody cover • May also be found in river bottoms or bog woods • Often hides under logs, stones, boards or in outbuildings • This species will often use communal sites (OMNR 2000)	• Habitat for this species has been determined through the consideration of Snake Hibernacula.
Eastern Ribbonsnake	• Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water • Also found in wet meadows, grassy marshes or sphagnum bogs or borders of ponds, lakes	• Habitat for this species has been determined through the consideration of Snake Hibernacula.

	or streams • Hibernates in groups (OMNR 2000)	
Mammals		
Woodland Vole	• Mature deciduous forest in the Carolinian forest zone with loose sandy soil and deep humus (OMNR 2000) • Also grasslands, meadows and orchards with groundcover of duff or grass (OMNR 2000)	• Area searches for suitable woodland vole habitat (ELC codes: FOD/ME) were conducted in conjunction with ELC mapping. • Searches for evidence of woodland voles occurred throughout each polygon while conducting vegetation inventories.
Vegetation		
Narrow-leaved Wild Leek	• Rich woods (OMNR 2000) • Blooms mid to late June (Michigan Flora Online 2011)	• Area searches for suitable narrow-leaved wild leek habitat (ELC codes: FO/WO) were conducted in conjunction with ELC mapping. • Searches for evidence of narrow-leaved wild leek versus *Allium tricoccum* occurred in August-October throughout each polygon while conducting vegetation inventories. • Distinguished post-flowering from all other *Allium* species by leaves that are distinctly narrower, silvery-green and pale-based (Michigan Flora Online 2011)
Green Dragon	• Wet bottomlands along rivers and creeks (OMNR 2000) • Blooms May-June (University of Wisconsin n.d.)	• Area searches for suitable green dragon habitat (ELC codes: FO/WO/SW) were conducted in conjunction with ELC mapping. • Searches for evidence of green dragon occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished post-flowering from all other species by distinctively long stalked leaf divided into 7-13 leaflets (University of Wisconsin n.d.).
Cooper's Milk Vetch	• Open woods and limestone plains (OMNR 2000) • Blooming occurs throughout June, while fruiting occurs throughout July (Wisconsin Department of Natural Resources 2011)	• Area searches for suitable cooper's milk vetch habitat (ELC codes: WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of cooper's milk vetch occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished post-flowering from all other species by pinnately divided leaves into

		11-23 leaflets with hairs beneath (Wisconsin Department of Natural Resources 2011),
Carey's Sedge	• Mesic to dry-mesic hardwood forests and floodplain woods (OMNR 2000) • Blooming occurs throughout June, while fruiting occurs throughout July (Wisconsin Department of Natural Resources 2011)	• Area searches for suitable carey's sedge habitat (ELC codes: FO/WO) were conducted in conjunction with ELC mapping. • Searches for evidence of carey's sedge occurred throughout each polygon in August-October while conducting vegetation inventories. • Very difficult to distinguish from other sedge species post-flowering.
Chinese Hemlock Parsley	• Calcareous cedar swamps, wet borders of streams and rivers, seepage slopes in wet coniferous woods, swampy thickets, moist clearings and damp roadsides (OMNR 2000) • Blooms August-September (University of Wisconsin n.d.)	• Area searches for suitable Chinese hemlock parsley habitat (ELC codes: FOC/WOC/SW) were conducted in conjunction with ELC mapping. • Searches for evidence of Chinese hemlock parsley occurred throughout each polygon in August-October while conducting vegetation inventories.
Tall Tickweed	• Damp prairies, thickets and open woods (OMNR 2000) • Blooms July-September (University of Wisconsin n.d.)	• Area searches for suitable tall tickweed habitat (ELC codes: TH/WO) were conducted in conjunction with ELC mapping. • Searches for evidence of tall tickweed occurred throughout each polygon in August-October while conducting vegetation inventories.
Ovate Beak Grass	• Riparian woodlands (OMNR 2000) • Flowers from June-October (Grasses of Iowa n.d.)	• Area searches for suitable ovate beak grass habitat (WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of ovate beak grass occurred throughout each polygon in August-October while conducting vegetation inventories.
Awnless Wild Rye	• Moist or damp soils of open forests, thickets, grasslands, ditches (USDA n.d.) • Also disturbed ground, especially on bottomland (USDA n.d.)	• Area searches for suitable awnless wild rye habitat (ELC codes: FO/TH/ME) were conducted in conjunction with ELC mapping. • Searches for evidence of awnless wild rye occurred throughout each polygon in August-October while conducting vegetation inventories.

		• Very difficult to distinguish from other sedge species post-flowering. Will be carried forward to EOS
Harbinger of Spring	• Rich, moist deciduous woods, open, wooded river floodplains and bottomlands (OMNR 2000) • Also stream banks and limestone shingle shores (OMNR 2000) • Blooms from March to May (University of Wisconsin n.d.)	• Area searches for suitable harbinger of spring habitat (ELC codes: WO/FO/SW) were conducted in conjunction with ELC mapping. • Searches for evidence of harbinger of spring occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished post-flowering from all other species by the purplish stem with a green base and a round root tuber as well as the repeatedly three parted leaf that is widely oval in outline (University of Wisconsin n.d.).
Burning Bush	• Dry to moist thickets and woods (OMNR 2000) • Blooms in June (Missouri Botanical Garden n.d.)	• Area searches for suitable burning bush habitat (ELC codes: TH/WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of burning bush occurred throughout each polygon while conducting vegetation inventories. • Distinguished from other *Euonymus* spp. post –flowering by the finely pubescent leaf blades over the entire surface (Michigan Flora 2012)
Pumpkin Ash	• Swamps (Gleason and Cronquist 1991)	• Area searches for suitable pumpkin ash habitat (ELC code: SW) were conducted in conjunction with ELC mapping. • Searches for evidence of pumpkin ash versus green ash occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished by leaf and leaflet shape. The leaves of pumpkin ash are much larger, with the leaflets more clearly petioled (the leaflet bases generally rounded rather than tapered to an indistinct petiole) and the leaflets are entire, while in green ash they are often toothed (Michigan Flora Online 2011)
Stiff Gentian	• Moist soil, roadsides, stream banks, edges of	• Area searches for suitable stiff

	woods and prairie habitats (OMNR 2000) • Blooms August-October (University of Wisconsin n.d.)	gentian habitat (ELC codes: WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of stiff gentian occurred throughout each polygon in August-October while conducting vegetation inventories.
Yellow Stargrass	• Dry open sandy woods and wet to dry meadows and prairies (OMNR 2000) • Blooms April-July (University of Wisconsin n.d.)	• Area searches for suitable yellow stargrass habitat (ELC codes: WO/FO/ME) were conducted in conjunction with ELC mapping. • Searches for evidence of yellow stargrass occurred throughout each polygon in August-October while conducting vegetation inventories. • Very difficult to distinguish from other grass species post-flowering.
Tall Blazing Star	• Open, sandy woods, dry roadsides and sandy prairies (OMNR 2000) • Blooms August-October (University of Wisconsin n.d.)	• Area searches for suitable tall blazing star habitat (ELC codes: WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of tall blazing star occurred throughout each polygon in August-October while conducting vegetation inventories.
American Gromwell	• Dry woods, thickets and fields (Gleason and Cronquist 1991) • Blooms May-June (University of Wisconsin n.d.)	• Area searches for suitable American gromwell habitat (ELC codes: WO/FO/TH/AG/ME) were conducted in conjunction with ELC mapping. • Searches for evidence of American gromwell occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished post-flowering from all other species by oval to oblong leaves with 2-3 prominent veins on each side. The fruit is nutlet white, shiny and egg shaped (University of Wisconsin n.d.).
Winged Loosestrife	• Wet meadows, moist prairies, open woods and wet disturbed areas (OMNR 2000) • Blooms July-September (University of Wisconsin n.d.)	• Area searches for suitable winged loosestrife habitat (ELC codes: ME/WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of winged loosestrife occurred throughout each polygon in

		August-October while conducting vegetation inventories. • Due to the similarity of this species to other loosestrifes post-flowering, this species will be carried forward to the EOS.
Slim-flowered Muhly	• Rich, deciduous forests, often on rocky or sandy soil (OMNR 2000)	• Area searches for suitable slim-flowered muhly habitat (ELC codes: WO/FO) were conducted in conjunction with ELC mapping.. • Searches for evidence of slim-flowered muhly occurred throughout each polygon while conducting vegetation inventories. • Very difficult to distinguish from other grass species post-flowering.
Slender Mountain-mint	• Upland woods and prairies (Gleason and Cronquist 1991) • Blooms July-September (University of Wisconsin n.d.)	• Area searches for suitable slender mountain-mint habitat (ELC codes: WO/FO) were conducted in conjunction with ELC mapping. • Searches for evidence of slender mountain-mint occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished post-flowering from other mint spp. by the small toothless, needle-like leaves (University of Wisconsin n.d.).
Woodland Bulrush	• Near seeps and stream edges (OMNR 2000)	• Area searches for suitable woodland bulrush habitat (ME/TH/WO/FO/AG/WE) were conducted in conjunction with ELC mapping. • Searches for evidence of woodland bulrush occurred throughout each polygon while conducting vegetation inventories. • Very difficult to distinguish from other grass species post-flowering.
Riddell's Goldenrod	• Wet, marshy ground, old fields and prairies (OMNR 2000) • Blooms August-October (University of Wisconsin n.d.)	• Area searches for suitable riddell's goldenrod habitat (ELC codes: OAG/ME/MA) were conducted in conjunction with ELC mapping. • Searches for evidence of riddell's goldenrod occurred throughout each polygon in August-October while conducting vegetation inventories.

Giant Ironweed	• Mesic prairies, thickets, moist woods, roadsides and grassy meadows (OMNR 2000) • Blooms August-September (Missouri Botanical Garden n.d.)	• Area searches for suitable giant ironweed habitat (ELC codes: WO/FO/ME) were conducted in conjunction with ELC mapping. • Searches for evidence of giant ironweed occurred throughout each polygon in August-October while conducting vegetation inventories.
Striped Cream Violet	• Rich, floodplain forests and low, wet woods (OMNR 2000) • Blooms April-June (University of Wisconsin n.d.)	• Area searches for suitable striped cream violet habitat (ELC codes: WO/FO/SW) were conducted in conjunction with ELC mapping. • Searches for evidence of striped cream violet occurred throughout each polygon in August-October while conducting vegetation inventories. • Distinguished post-flowering from other violet spp. by the finely toothed and pleated leaves (University of Wisconsin n.d.)
Other Wildlife		
Blue-ringed Dancer	• Large rivers, creeks and streams that are often well vegetated and can also be found around lakes and ditches (Lam 2004)	• Area searches for suitable blue-ringed dancer habitat were conducted in conjunction with ELC mapping and aquatic habitat assessments. • Searches for evidence of blue-ringed dancer occurred throughout each polygon while conducting vegetation inventories and aquatic assessments.
Tawny Emperor	• Open woodlands and roadsides where hackberry occurs	• Area searches for suitable tawny emperor habitat (WO/FO/CVI) were conducted in conjunction with ELC mapping and aquatic habitat assessments. • Searches for evidence of tawny emperor occurred throughout each polygon while conducting vegetation inventories and aquatic assessments.
Double-striped Bluet	• Lakes and ponds and is often found in temporary habitats with little vegetation (Lam 2004) • They can also be occasionally found in slow streams (Lam 2004)	• Area searches for suitable double-striped bluet habitat (AQ) were conducted in conjunction with ELC mapping and aquatic habitat assessments. • Searches for evidence of double-striped bluet occurred throughout each polygon while conducting vegetation inventories and aquatic assessments.

Pronghorn Clubtail	• Ponds, lakes and slow streams (Lam 2004)	• Area searches for suitable pronghorn clubtail habitat (AQ) were conducted in conjunction with ELC mapping and aquatic habitat assessments. • Searches for evidence of pronghorn clubtail occurred throughout each polygon while conducting vegetation inventories and aquatic assessments.

5.6.4 Animal Movement Corridors

Animal movement corridors are defined by the Ontario Ministry of Natural Resources as "elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another" (OMNR 2000). Animal movement corridors are represented by a diversity of landscape features such as stream and river valleys, woodlands, fencerows, as well as abandoned road and rail allowances (OMNR 2000). The potential for animal movement corridors to occur in the project area is contingent on confirming significant wildlife habitats such as deer wintering areas, amphibian breeding habitats, etc. The OMNR has stated there are no significant deer habitats within the project area (OMNR 2011c); therefore, deer movement corridors have not been further investigated. The presence of amphibian movement corridor features was examined based on the habitat characteristics outlined in Table 8.

Table 8. General Characteristics Used to Identify Animal Movement Corridors

Wildlife Habitat Type	Criteria	Methods
Amphibian Movement Corridors	• Corridors may be found in all ecosites associates with water[1]. • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway[1]. • Importance of areas to be linked by corridor[3] • Importance of corridor to survival of target species[3] • Dimensions[3] • Continuity[3] • Habitat and structure[3] • Risk of mortality[3] • Protection[3] • Other related values[3]	• Significant amphibian breeding habitat to be examined for amphibian movement corridors • The width and presence of gaps along potential corridors were determined using GIS mapping.

[3]:OMNR Significant Wildlife Habitat Technical Guide Appendix Q (2000)

Figure 3

Bornish Wind Energy Centre

Vegetation Communities - Northwest

Legend

- Project Area (120m)
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Ecological Land Classification (ELC)
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody

(CVR) Residential
(FOCM6) Naturalized Coniferous Plantation
(FOCM6-1) Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
(FODM4-2) Dry - Fresh White Ash - Hardwood Deciduous Forest Type
(FODM5-5) Dry – Fresh Sugar Maple – Hickory Deciduous Forest Type
(FODM5-6) Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type
(FODM12) Naturalized Deciduous Plantation Ecosite
(IAG) Agricultural Infrastructure
(MEFM1) Dry - Fresh Forb Meadow Ecosite
(OAGM1) Annual Row Crops
(OAGM2) Perennial Row Crops
(OAGM4) Open Pasture
(SWDM3-2) Silver Maple Mineral Deciduous Swamp Type
(THD) Deciduous Thicket
(THMM2) Fresh - Moist Mixed Thicket Ecosite
(WOCM1) Dry - Fresh Coniferous Woodland Ecosite
(WODM4-2) White Ash Deciduous Woodland Type
(WODM4-3) Sugar Maple Deciduous Woodland Type
(WODM5) Fresh - Moist Deciduous Woodland Ecosite
(WODM5-2) Fresh - Moist Elm Deciduous Woodland Type

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Project: 1231
Date: March 27, 2012

NAD83 - UTM Zone 17
Scale: 1:20,000 (11x17")

0 200 400 600 800 1,000 Metres

N

Path: X:\1231_BornishWindFarm\SI_EOS_Mapping\NRSI_1231_Fig3_BornishWF_ELC_20K_2012_03_27_KEB.mxd

Figure 4

Bornish Wind Energy Centre

Vegetation Communities - Northeast

Legend

- Project Area (120m)
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Ecological Land Classification (ELC)
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody

(CVR) Residential
(FOCM6-1) Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
(FODM4-2) Dry - Fresh White Ash - Hardwood Deciduous Forest Type
(FODM4-4) Dry - Fresh Ironwood Deciduous Forest Type
(FODM5-2) Dry - Fresh Sugar Maple - Beech Decuduous Forest Type
(FODM5-6) Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type
(FODM5-8) Dry - Fresh Sugar Maple - White Ash Deciduous Forest Type
(IAG) Agricultural Infrastructure
(SWDN2-2) Green Ash Mineral Deciduous Swamp Type
(OAGM1) Annual Row Crops
(OAGM2) Perennial Row Crops
(OAGM4) Open Pasture
(THD) Deciduous Thicket
(WODM4-2) White Ash Deciduous Woodland Type
(WODM4-3) Sugar Maple Deciduous Woodland Type
(WODM5) Fresh - Moist Deciduous Woodland Ecosite

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Project: 1231
Date: March 27, 2012

NAD83 - UTM Zone 17
Scale: 1:20,000 (11x17")

0 200 400 600 800 1,000 Metres

N

Path: X:\1231_BornishWindFarm\SI_EOS_Mapping\NRSI_1231_Fig4_BornishWF_ELC_20K_2012_03_27_KEB.mxd