

Figure 13

# Bornish Wind Energy Centre Generalized Wildlife Habitat - Northwest



### Legend

- Project Area (120m)
- Generalized Mitigation Habitat
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody



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Project: 1231 Date: February 24, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")
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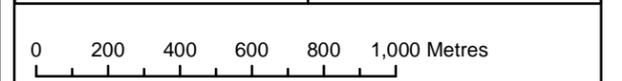




Figure 14

# Bornish Wind Energy Centre Generalized Wildlife Habitat - Northeast



### Legend

- Project Area (120m)
- Generalized Mitigation Habitat
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody



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Project: 1231 Date: February 24, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")
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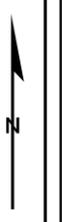
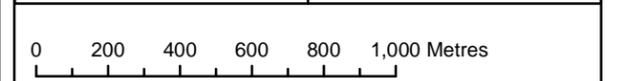
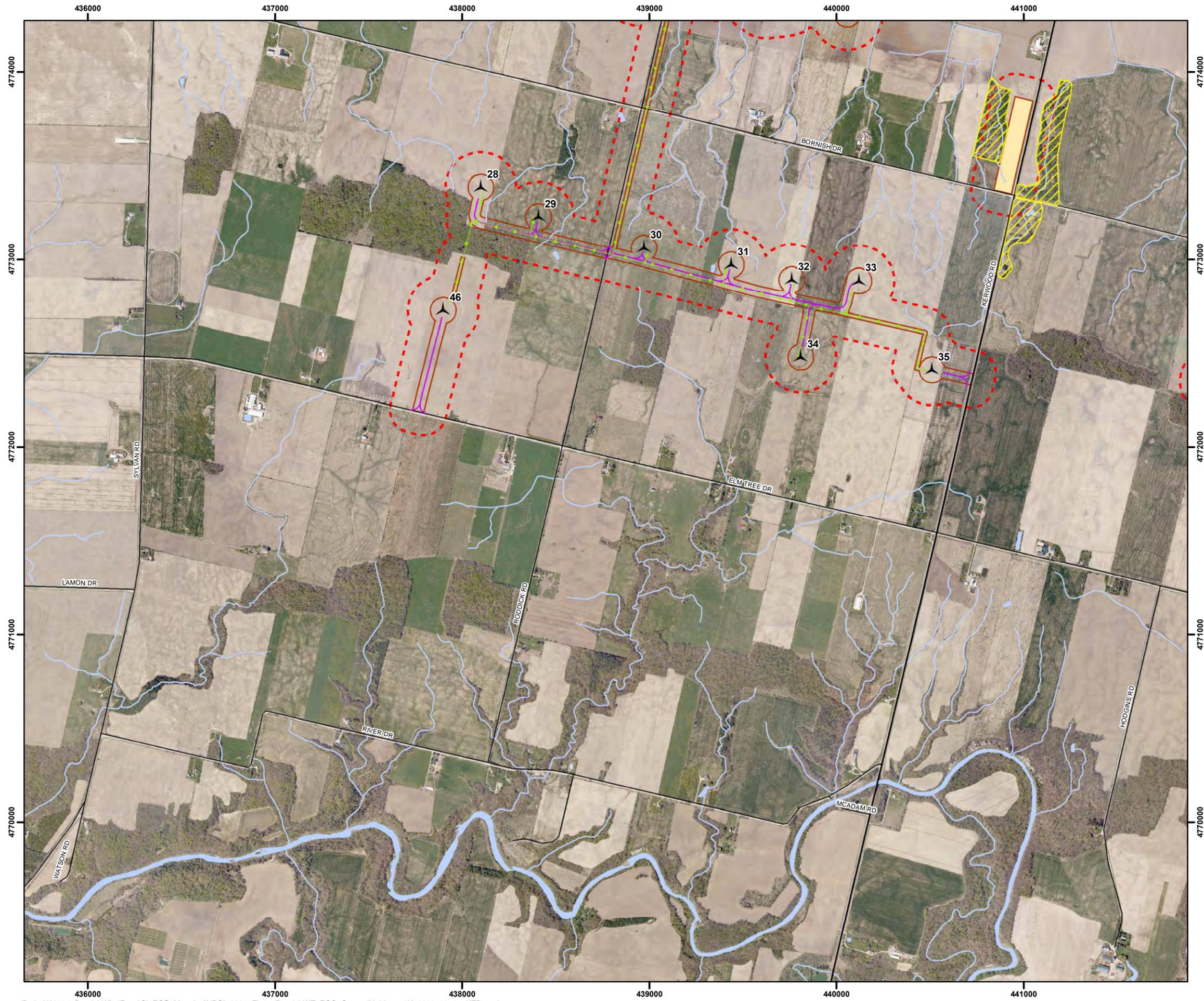




Figure 15

# Bornish Wind Energy Centre Generalized Wildlife Habitat - Southwest



**Legend**

- Project Area (120m)
- Generalized Mitigation Habitat
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody



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Project: 1231 Date: February 24, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")
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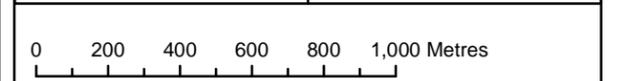
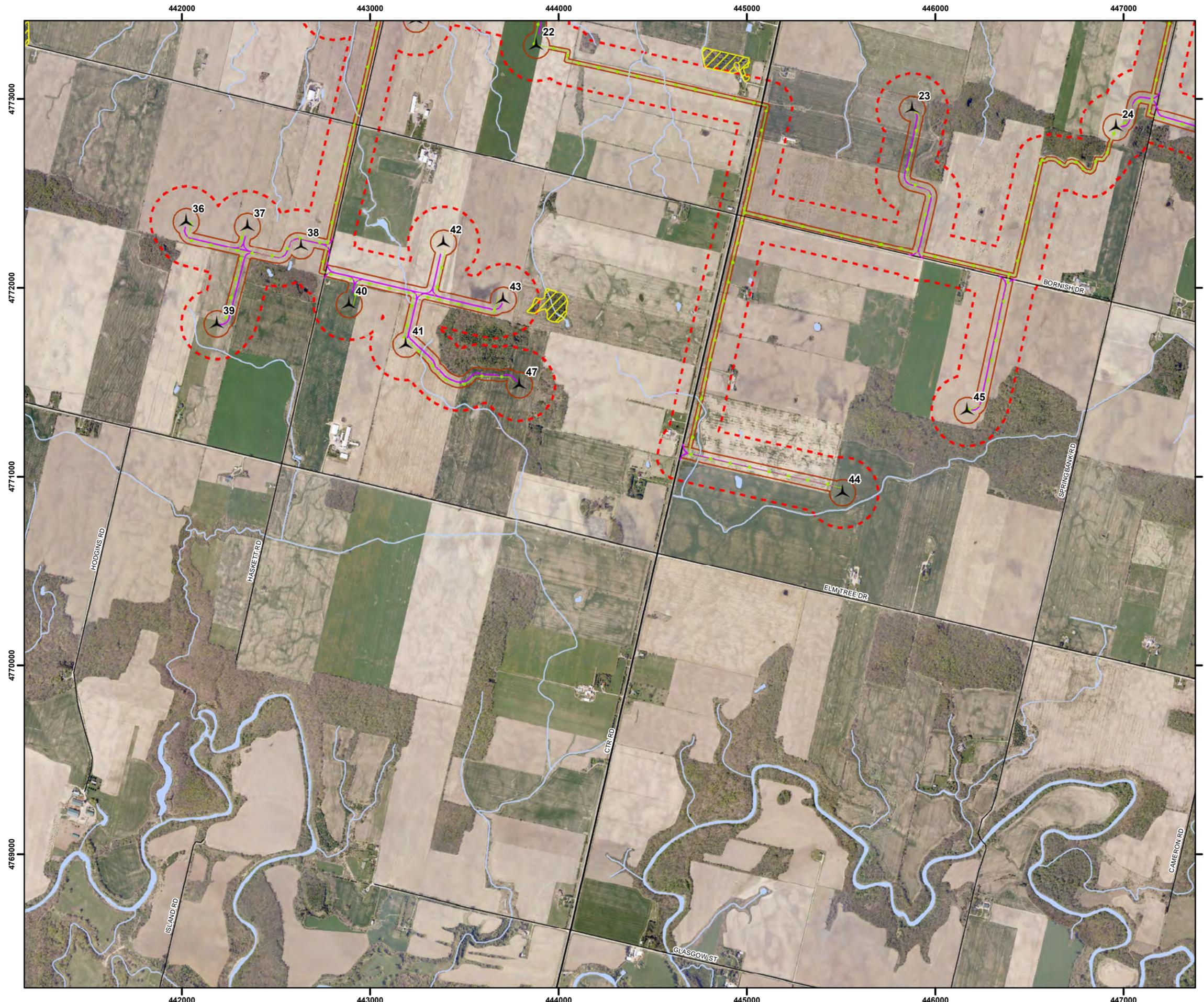




Figure 16

# Bornish Wind Energy Centre Generalized Wildlife Habitat - Southeast



### Legend

- Project Area (120m)
- Generalized Mitigation Habitat
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody



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Project: 1231 Date: March 7, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")
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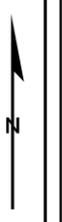
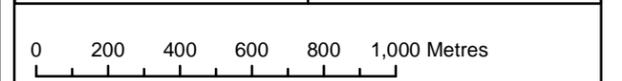




Figure 17

# Bornish Wind Energy Centre Generalized Wildlife Habitat - T-Line

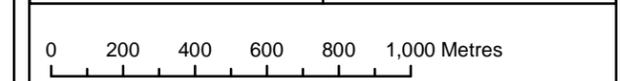


- Legend**
- Project Area (120m)
  - Generalized Mitigation Habitat
  - Project Location
  - Turbine
  - Access Road
  - Transmission Line
  - Collector System
  - Staging Area
  - Interconnection Facilities
  - Substation
  - Existing Transmission Line
  - Primary Road
  - Secondary Road
  - Railroad
  - Intermittent Watercourse
  - Permanent Watercourse
  - Waterbody



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Project: 1231 Date: March 30, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")
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## 6.0 Description of the Proposed Undertaking

In accordance with the Renewable Energy Approval (REA), the presence of significant natural features within the Bornish Wind Energy Centre project area has been reviewed by NRSI biologists. Based on natural features, vegetation communities, and wildlife species present within the project area, summarized in previous sections, NRSI biologists have evaluated the project area for potentially significant natural areas and habitats. NRSI has used the detailed records review to evaluate the environmental significance of each of these potentially significant features, using evaluation criteria outlined in the Natural Heritage Reference Manual (OMNR 2010a) and Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000) and Significant Wildlife Habitat Ecoregion 7E Schedule (OMNR 2011a).

Additional information relating to the development of this project, including detailed descriptions of the construction, have been provided in the Construction Plan Report, prepared by GL-Garrad Hassan under separate cover. This document provides additional construction details and potential environmental impacts associated with the construction of the Bornish Wind Energy Centre. The specific environmental impacts associated relating to the natural heritage features and wildlife habitats have been discussed in detail within the following sections.

- Table 6 provides a summary of construction phase activities and the potential negative environmental effects
- Table 9 provides a summary of significant natural features within 120m, potential negative environmental impacts to the features and mitigation measures applied to address negative impacts
- Table 11 provides a summary of potential effects and mitigation measures for generalized candidate significant wildlife habitat during the construction and decommissioning phases
- Table 13 provides a summary of construction phase mitigation measures that will be implemented to address negative environmental impacts to significant and provincially significant natural features.

## 6.1 Site Preparation and Servicing

Several site preparation activities will be required at the Bornish Wind Energy Centre in advance of specific construction activities. These tasks largely include activities associated with clearing and leveling of the project location. Potential vegetation removal and grading activities associated with the development of this project have been considered in Table 5 below.

**Table 5. Summary of Site Preparation and Servicing Activities and Potential Negative Environmental Effects overlapping, and within 120m, of the Bornish Wind Energy Centre**

Project Activity	Extent of Effect	Potential Negative Effects
Vegetation Removal (Shoreline/Riparian Habitat)	None Expected	N/A
Vegetation Removal (Wetland Habitat)	None Expected	N/A
Vegetation Removal (Upland Habitat)	<p>Vegetation removal may occur within 2 woodlands where the project location slightly overlaps with a wooded dripline boundary. In both cases, vegetation removal (if any) will be limited to the woodland edge and will be extremely minor in nature, and entirely located within the road right-of-way.</p> <p>For the purposes of this report, NRSI assumes that no specific vegetation will be removed, however given the close proximity to these features, accidental damage to limbs and/or root zones may occur and has been addressed within this EIS.</p> <p>Other areas of upland vegetation clearing will be limited to hedgerow crossings which will occur perpendicular to the hedgerow orientation.</p>	<ul style="list-style-type: none"> <li>• Loss of vegetation and wildlife habitat</li> <li>• Loss of natural linkages and corridors for animal movement</li> <li>• Disturbance of wildlife species</li> </ul>
Grading	Minimal grading is expected to occur within the project area.	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation and turbidity</li> <li>• Changes in natural drainage and altered surface runoff</li> <li>• Changes in soil moisture</li> <li>• Disturbance of wildlife species</li> </ul>

## 6.2 Construction

The construction phase of the Bornish Wind Energy Centre will involve the installation of 45 (up to 48) operational wind energy generating turbines, as well as all supporting infrastructure, such as access roads, electrical cabling, transmission lines, and associated buildings. The details of these construction activities, and potential negative effects that may be associated with each activity, have been outlined in Table 6 below.

**Table 6. Summary of Construction Phase Activities and Potential Negative Environmental Effects overlapping, and within 120m, of the Bornish Wind Energy Centre**

Project Activity	Extent of Effect	Potential Negative Effects
Building Construction	Two supporting facilities (buildings) will be associated with the Bornish Wind Energy Centre. These include the substation and point of interconnection.	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Water contamination by oils, gasoline, grease, and other materials</li> <li>• Increase in impervious surfaces and increased surface run-Off</li> <li>• Temporary noise, and potential avoidance, disturbance of wildlife species</li> </ul>
Turbine Erection	<p>A total of 45 (up to 48) operational turbines will installed as part of the Bornish Wind Energy Centre.</p> <p>As part of the turbine erection, laydown areas and crane pads will be placed around the base of the turbine. Within this area, the ground will be leveled.</p> <p>The crane pads, measuring approximately 15m x 35m, will require the removal of 600mm of topsoil and addition of clean, compacted, gravel.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Water contamination by oils, gasoline, grease, and other materials</li> <li>• Increase in impervious surfaces and increased surface run-Off</li> <li>• Temporary noise, and potential avoidance, disturbance of wildlife species</li> </ul>
Roads – Water Crossings	<p>A total of 3 new water body crossing locations of access roads have been identified as part of the Bornish Wind Energy Centre.</p> <p>An additional 18 water crossings have been identified within the project area. These will be crossed by cabling, with 5 crossed by above ground transmission lines, which are expected to have little, if any, direct impact on water features.</p> <p>The remaining 13 crossing locations are a result of underground cabling. All of these locations have been identified as</p>	<ul style="list-style-type: none"> <li>• Changes in stream alignment or flow regimes</li> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Loss of riparian vegetation</li> <li>• Interruption of a linkage along a watercourse</li> <li>• Attraction of wildlife to roadsides or roads</li> <li>• Barriers to wildlife movement</li> <li>• Temporary noise, and potential avoidance, disturbance of wildlife species</li> </ul>

	<p>suitable candidates for open cut trenching in dry conditions following appropriate in-water guidance.</p> <p>Ausable Bayfield Conservation Authority (ABCA) will be involved in determining the final methods for all 21 water crossing locations.</p>	
Roads - Paving	<p>Access roads will be constructed to be 11m wide during the construction phase to allow for large cranes. After construction, these roads will be reduced to a final post-construction width of 6m.</p> <p>Access road construction will include clearing top-soil to a depth of 300-600mm. Roads will be topped with clean type 'A' or Type 'B' gravel.</p>	<ul style="list-style-type: none"> <li>• Increased surface runoff and reduced infiltration</li> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Loss of wildlife habitat</li> <li>• Barriers to wildlife movement</li> <li>• Increased wildlife mortality due to vehicle collisions</li> </ul>
Underground Cabling – Open Cut	<p>Most of the underground cabling within the project area will be installed by way of open cut trenches.</p> <p>This will include all cabling on private land (with the exception of the 2 locations of directional drilling), and all of the roadside collector system.</p> <p>Trenches will be approximately 0.9m deep, and all excavated soil will be retained and used to fill the trench after cables have been laid.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Temporary noise, and potential avoidance, disturbance of wildlife species</li> </ul>
Underground Cabling – Horizontal Direction Drilling	<p>Two locations of horizontal directional drilling will occur within the Bornish Wind Energy Centre.</p> <p>This directional drilling will occur south of T28 and north of T46, as well as east of T8 and west of T9, and will be used to extend cabling beneath the woodlands without direct impact.</p> <p>Upon finalization of water body crossing details, it is possible that additional locations of directional drilling may be required at the request of ABCA.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Water contamination by chemical spill</li> <li>• Temporary noise, and potential avoidance, disturbance of wildlife species</li> </ul>
Overhead Cabling	<p>Overhead cabling will be proposed along the length of the transmission line, extending from the Bornish substation, north along Kerwood Road, then east along Elginfield and Nairn Roads to the Point of Interconnection.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Loss of upland vegetation</li> <li>• Direct wildlife (avian) mortality due collisions with lines</li> <li>• Temporary noise, and potential avoidance, disturbance of wildlife</li> </ul>

	Overhead cabling will either be mounted on existing or new poles that will be between 18-30m tall. Poles will be installed using augered holes that are approximately 1-2m deep.	species
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### 6.3 Operation

The operational phase of the Bornish Wind Energy Centre will include the operation of 45 (up to 48) wind energy generating turbines, as well as all associated regular maintenance activities. The potential negative effects of this facility during the operational phase of the project have been summarized in Table 7 below.

**Table 7. Summary of Operational Phase Activities and Potential Negative Environmental Effects within 120m of the Bornish Wind Energy Centre**

Project Activity	Extent of Effect	Potential Negative Effects
Groundwater and Surfacewater Taking	None Expected	N/A
Application of Herbicides	Application of herbicides may occur within the project area to help control vegetation growth beneath turbines and/or along above ground cabling routes (i.e. transmission lines)	<ul style="list-style-type: none"> <li>• Loss of natural vegetation</li> <li>• Contamination of wetlands, woodlands, water bodies, or other wildlife habitats,</li> <li>• Direct mortality to local wildlife</li> </ul>
Turbine Operation	The Bornish Wind Energy Centre will consist of 45 (up to 48) total operational wind turbines.	<ul style="list-style-type: none"> <li>• Disturbance to wildlife species</li> <li>• Direct mortality to avian and bat species</li> </ul>
Turbine Maintenance	Regular maintenance will occur at all of the operational turbines at the Bornish Wind Energy Centre.  In addition to regularly scheduled maintenance, occasional unscheduled maintenance activities may be required.	<ul style="list-style-type: none"> <li>• Water contamination by oils, gasoline, grease, and other materials</li> <li>• Disturbance of wildlife species</li> </ul>

### 6.4 Decommissioning

The decommissioning phase of the Bornish Wind Energy Centre will include the dismantling and removal of the project infrastructure associated with this project. The Details of this project phase, along with potential negative, have been provided in Table 8 below.

**Table 8. Summary of Decommissioning Phase Activities and Potential Negative Environmental Effects within 120m of the Bornish Wind Energy Centre**

Project Activity	Extent of Effect	Potential Negative Effects
Building Removal	Two supporting facilities ('buildings') will be associated with the Bornish Wind Energy Centre. These include the substation and point of interconnection.	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Water contamination by oils, gasoline, grease, and other materials</li> <li>• Disturbance of wildlife species</li> </ul>
Turbine Removal	<p>45 (up to 48) operational turbines will be removed as part of the decommissioning plan for the Bornish Wind Energy Centre.</p> <p>As part of the turbine removal, laydown areas and crane pads will be placed around the base of the turbine. Within this area, the ground will be leveled.</p> <p>Following the removal of turbines, the land is expected to return to land use present prior to turbine installation. In all cases this will be agricultural activities.</p> <p>Removal of turbine components will also include the removal of the top 3 feet of the underground foundation.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Water contamination by oils, gasoline, grease, and other materials</li> <li>• Disturbance of wildlife species</li> </ul>
Underground Cabling Removal – Open Cut	<p>Most of the underground cabling within the project area will be installed by way of open cut trenches. This will include all cabling on private land (with the exception of the 2 locations of directional drilling), and all of the roadside collector system.</p> <p>Underground electrical lines will be cut, the ends buried to 1 m below grade, and left in place</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Disturbance of wildlife species</li> </ul>
Underground Cabling Removal – Horizontal Direction Drilling	<p>Two locations of horizontal directional drilling will occur within the Bornish Wind Energy Centre.</p> <p>This directional drilling will occur south of T28 and north of T46, as well as east of T8 and west of T9, and will be used to extend cabling beneath the woodlands without direct impact.</p> <p>After the duration of the project, this cable will be left in place to avoid the potential for additional, and unnecessary, impacts associated with the removal of this cable.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Disturbance of wildlife species</li> </ul>

Overhead Cabling	<p>As part of this project, overhead cabling will be installed along the length of the transmission line, extending from the Bornish substation, north along Kerwood Road, then east along Elginfield and Nairn Roads to the Point of Interconnection.</p> <p>Upon decommissioning of the project, these lines will be dismantled and removed. All poles and cabling solely associated with this project will be removed at the end of the project life.</p>	<ul style="list-style-type: none"> <li>• Increased erosion, sedimentation, and turbidity</li> <li>• Disturbance of wildlife species</li> </ul>
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## 6.5 Approach to Impact Assessment

For the purposes of this report, the analysis of potential impacts has been divided into the different classifications of significant natural features, as identified by the evaluation of significance section of this report, with significant wildlife habitat further subdivided based on the distance to project location, type of wildlife habitat, and methods of determining significance, as follows:

- Areas of Natural and Scientific Interest
- Significant Wetlands
- Significant Valleylands
- Significant Woodlands
- Significant Wildlife Habitat
  - Project Location within SWH
  - Project Location within 120m of Confirmed SWH
  - Project Location within 120m of SWH Treated as Significant
  - Generalized Impacts to Wildlife Habitat

Potential impacts on each of the significant features or wildlife habitats within the Bornish project area have been discussed collectively based on their respective distance to the closest project location that has the potential to have an operational impact. Given the potential impacts at various distances to project location, NRSI has grouped groups of features or wildlife habitats into 3 broad distance categories, overlapping, 0-30m, and 30-120m, from a project location with an operational impact. These distance categories have been chosen as they each have the potential for different types of impacts on wildlife habitat and natural features. Although there is a expected to be a gradual increase in potential impacts as development occurs closer to natural features or wildlife

habitat, a distance of 30m has been chosen as a suitable division between specific types of impacts. For areas where the project location is within 30m of a natural feature or significant wildlife habitat, there is increased potential for impacts relating to sedimentation and erosion, visual and noise disturbance to wildlife, impacts for accidental spills, and other localized impacts. The impacts within each of these distance categories are expected to be relatively consistent within the given distance, with slightly different impacts (and related mitigation measures) associated with each distance category.

## 7.0 Environmental Impact Study

In accordance with the Renewable Energy Approval (REA), the presence of significant natural features within the Bornish Wind Energy Centre project area has been reviewed by NRSI biologists. Based on natural features, vegetation communities, and wildlife species present within the project area, summarized in previous sections, NRSI biologists have evaluated the project area for potentially significant natural areas and habitats. NRSI has used the detailed records review to evaluate the environmental significance of each of these potentially significant features, using evaluation criteria outlined in the Natural Heritage Reference Manual (OMNR 2010a) and Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000).

Each of these significant natural features are discussed in more detail below, including potential impacts and proposed mitigation measures, types are described further below. Additional consideration has been given to mitigation measures and monitoring programs for this project in the Environmental Effects Monitoring Plan, which has been prepared under separate cover by GL-Garrad Hassan. This report summarizes the potential environmental effects of the project and details the monitoring programs that will be implemented during the various phases of the Bornish Wind Energy Centre.

- For significant woodlands, wetlands and valleylands, Table 9 provides a summary of performance objectives, mitigation measures to assist in achieving the performance objectives and a program for monitoring the negative environmental effects along with a contingency plan to be implemented if any mitigation measures fail.
- For significant wildlife habitats, Table 10 provides a summary of performance objectives, mitigation measures to assist in achieving the performance objectives and a program for monitoring the negative environmental effects along with a contingency plan to be implemented if any mitigation measures fail.
- Table 14 provides a summary of the post-construction monitoring commitments

### 7.1 Significant Natural Features

No significant natural features, including provincial parks, conservation reserves, or Areas of Natural and Scientific Interest (Life Science or Earth Science) are present within 120m of the Bornish Wind Energy Centre project location. No potentially negative impacts on these natural features are anticipated.

## 7.2 Significant Woodlands, Wetlands, and Valleylands

NRSI biologists have identified several significant woodlands, wetlands, and valleylands within 120m of the Bornish Wind Energy Centre project location. Potential negative impacts and proposed mitigation measures for each of these features has been detailed in Table 9 below. This table discusses each of these three natural feature types (woodland, wetland, and valleyland) based on the general distances that they are found from the project location. As described above, for purposes of impact assessment and recommended mitigation measures, the general distance categories have been established as overlapping, 0-30m, and 30-120m from the project location.

**Table 9. Summary of Significant Natural Features and Wildlife Habitat within 120m of the Bornish Wind Energy Centre**

Feature ID	Distance to Project Location	Potential Impacts	Mitigation Measures	Performance Objectives, Monitoring, and Contingency Plans
WOD 006 WOD 008	Overlapping	<p>These two woodlands will be overlapped through the implementation of horizontal directional drilling, with no specific overlap of project location with these features. The critical root zone, although dependant on tree species and soil conditions, typically occurs in the top 4-5 feet below the surface, and within the limits of the dripline. In order to avoid impacts to the critical root zone during directional drilling, drilling will occur at a depth of at least 5 feet deep, which will be maintained while below the woodland. The woodlands have been mapped to include approximate (non-surveyed) dripline boundary.</p> <p>Additional mitigation measures have been addressed below at the closest point of construction activity.</p>		
WOD-001 WOD-002 WOD-003 WOD-004 WOD-006 WOD-007 WOD-008 WOD-009 WOD-010 WOD-013 WOD-014 WOD-015 WOD-016 WOD-018 WOD-023 WOD-024 WOD-027 WOD-028 WOD-029 WOD-045 WOD-046 WOD-047 WOD-048 WOD-050 WOD-052 WOD-053	0-30m	<ul style="list-style-type: none"> <li>Accidental damage to vegetation, including limbs and root zones</li> </ul>	<ul style="list-style-type: none"> <li>Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to species to be retained.</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize direct impacts on vegetation communities and protect rare/sensitive habitats,</li> </ul> <p>Monitoring:</p> <ul style="list-style-type: none"> <li>None required</li> </ul> <p>Contingency Measure:</p> <ul style="list-style-type: none"> <li>Any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.</li> </ul>
		<ul style="list-style-type: none"> <li>Sedimentation and erosion</li> </ul>	<ul style="list-style-type: none"> <li>Implement a sediment and erosion control plan,</li> <li>Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction area.</li> </ul>	<p>Performance Objective</p> <ul style="list-style-type: none"> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> <p>Monitoring:</p> <ul style="list-style-type: none"> <li>None required</li> </ul> <p>Contingency Measure:</p> <ul style="list-style-type: none"> <li>Maintain or restore vegetated buffers, including riparian zones</li> </ul>
		<ul style="list-style-type: none"> <li>Spills (i.e. oil, gasoline, grease, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize impacts to natural features and associated wildlife</li> </ul>

			30m from any significant natural feature.	habitats No monitoring or contingency plan required
		<ul style="list-style-type: none"> <li>Changes in soil moisture and compaction</li> </ul>	<ul style="list-style-type: none"> <li>Implement infiltration techniques to the maximum extent possible.</li> <li>Minimize paved surfaces and design roads to promote infiltration.</li> </ul>	Performance Objective: <ul style="list-style-type: none"> <li>Minimize impact to soil moisture regime and vegetation species composition</li> </ul> No monitoring or contingency plan required
WOD-001 WOD-002 WOD-003 WOD-004 WOD-006 WOD-007 WOD-008 WOD-009 WOD-010 WOD-012/WOD-021 WOD-022 WOD-023 WOD-024 WOD-025 WOD-027 WOD-028 WOD-029 WOD-030 WOD-031 WOD-038 WOD-039 WOD-045 WOD-046 WOD-047 WOD-048 WOD-050 WOD-051 WOD-052 WOD-053	30-120m	<ul style="list-style-type: none"> <li>Spills (i.e. oil, gasoline, grease, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant natural feature.</li> <li>Develop a spill response plan and train staff on appropriate procedures.</li> <li>Keep emergency spill kits on site.</li> <li>Dispose of waste material by authorized and approved offsite vendors.</li> </ul>	Performance Objective: <ul style="list-style-type: none"> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> Monitoring: <ul style="list-style-type: none"> <li>None required</li> </ul> Contingency Measure: <ul style="list-style-type: none"> <li>Develop a spill response plan and train staff on appropriate procedures.</li> <li>Keep emergency spill kits on site.</li> </ul>
		<ul style="list-style-type: none"> <li>Changes in soil moisture and compaction</li> </ul>	<ul style="list-style-type: none"> <li>Implement infiltration techniques to the maximum extent possible,</li> <li>Minimize paved surfaces and design roads to promote infiltration.</li> </ul>	Performance Objective: <ul style="list-style-type: none"> <li>Minimize impact to soil moisture regime and vegetation species composition</li> </ul> No monitoring or contingency plan required

WET-002B Wetland WET-002C Wetland WET-003 Wetland WET-010 Wetland WET-014 Wetland	0-30m	<ul style="list-style-type: none"> <li>Sedimentation and erosion</li> </ul>	<ul style="list-style-type: none"> <li>Implement a sediment and erosion control plan,</li> <li>Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction area.</li> </ul>	<p>Performance Objectives:</p> <ul style="list-style-type: none"> <li>Maintain or restore vegetated buffers, including riparian zones</li> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> <p>No monitoring or contingency plan required</p>
		<ul style="list-style-type: none"> <li>Spills (i.e. oil, gasoline, grease, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant natural feature.</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> <p>No monitoring or contingency plan required</p>
		<ul style="list-style-type: none"> <li>Changes in soil moisture and compaction</li> </ul>	<ul style="list-style-type: none"> <li>Implement infiltration techniques to the maximum extent possible.</li> <li>Minimize paved surfaces and design roads to promote infiltration,</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize impact to soil moisture regime and vegetation species composition</li> </ul> <p>No monitoring or contingency plan required</p>
WET-002A Wetland WET-008 Wetland WET-018 Wetland WET-025 Wetland WET-030 Wetland	30-120m	<ul style="list-style-type: none"> <li>Spills (i.e. oil, gasoline, grease, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant natural feature.</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> <p>No monitoring or contingency plan required</p>
		<ul style="list-style-type: none"> <li>Changes in soil moisture and compaction</li> </ul>	<ul style="list-style-type: none"> <li>Implement infiltration techniques to the maximum extent possible,</li> <li>Minimize paved surfaces and design roads to promote infiltration.</li> </ul>	<p>Performance Objective</p> <ul style="list-style-type: none"> <li>Minimize impact to soil moisture regime and vegetation species composition</li> </ul> <p>No monitoring or contingency plan required</p>
VAL-004 Valleyland VAL-047 Valleyland	0-30m	<ul style="list-style-type: none"> <li>Accidental damage to vegetation, including limbs and root zones</li> </ul>	<ul style="list-style-type: none"> <li>Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to species</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize direct impacts on vegetation communities and</li> </ul>

			<p>to be retained,</p> <ul style="list-style-type: none"> <li>No vegetation removal will occur in rare plant communities or on sensitive landforms.</li> </ul>	<p>protect rare/sensitive habitats,</p> <p>No monitoring required</p> <p>Contingency Plan:</p> <ul style="list-style-type: none"> <li>Any tree limbs or roots that are accidentally damaged by construction activities will be pruned using proper arboricultural techniques.</li> </ul>
		<ul style="list-style-type: none"> <li>Sedimentation and erosion</li> </ul>	<ul style="list-style-type: none"> <li>Implement a sediment and erosion control plan,</li> <li>Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction area.</li> </ul>	<p>Performance Objective</p> <ul style="list-style-type: none"> <li>Maintain or restore vegetated buffers, including riparian zones</li> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> <p>No monitoring or contingency plan required</p>
		<ul style="list-style-type: none"> <li>Spills (i.e. oil, gasoline, grease, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>All maintenance activities, vehicle refueling or washing, and chemical storage will be located more than 30m from any significant natural feature.</li> <li>Develop a spill response plan and train staff on appropriate procedures.</li> <li>Keep emergency spill kits on site.</li> <li>Dispose of waste material by authorized and approved offsite vendors.</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Minimize impacts to natural features and associated wildlife habitats</li> </ul> <p>No monitoring or contingency plan required</p>
		<ul style="list-style-type: none"> <li>Changes to surface water hydrology</li> </ul>	<ul style="list-style-type: none"> <li>Limit changes in land contours</li> </ul>	<p>Performance Objective:</p> <ul style="list-style-type: none"> <li>Maintain streams and timing and quantity of flow</li> <li>Maintain existing surface water flow patterns</li> </ul> <p>No monitoring or contingency plan</p>

				required
		<ul style="list-style-type: none"> <li>Changes in soil moisture and compaction</li> </ul>	<ul style="list-style-type: none"> <li>Implement infiltration techniques to the maximum extent possible,</li> <li>Minimize paved surfaces and design roads to promote infiltration.</li> </ul>	Performance Objective: <ul style="list-style-type: none"> <li>Minimize impact to soil moisture regime and vegetation species composition</li> </ul> No monitoring or contingency plan required

### 7.3 Significant Wildlife Habitat

NRSI biologists have completed comprehensive site investigations and evaluations of significance of all potential wildlife habitats within the Bornish Wind Energy Centre. These studies have determined that several significant or presumed significant, wildlife habitats are present within 120m of the project location. In accordance with the REA Regulation, each of these features within 120m of a project component expected to have an operational impact, as per Appendix D of the Natural Heritage Assessment Guide (OMNR 2011a), has been specifically addressed below. Other significant, or presumed significant, wildlife habitats present within 120m of project components that will not have an operational impact on the habitat have been collectively addressed as part of the generalized mitigation measures in Section 7.3.4. As described above, for purposes of impact assessment and recommended mitigation measures, the general distance categories have been established as overlapping, 0-30m, and 30-120m from the project location. These measurements coincide with the distance from a significant wildlife habitat to the closest project component with an operational impact.

#### 7.3.1 Project Location within Wildlife Habitat

One significant wildlife habitat (AWO 002) is found overlapping with the Bornish project location. This habitat will be crossed by underground cabling installed using horizontal directional drilling, and is considered not to be overlapping the project location. Additionally, the project components within 120m of this habitat are not considered to have the potential for operational impacts, and as such, this habitat has been considered generalized wildlife habitat and addressed in Section 7.3.4.

#### 7.3.2 Project Location within 120m of Confirmed Significant Habitat

Through the detailed surveys conducted as part of the evaluation of significance, NRSI biologists have not confirmed the presence of any significant wildlife habitats within 120m of project components that may have operational impacts on those habitat type.

#### 7.3.3 Project Location within 120m of Wildlife Habitat Treated as Significant

In addition to wildlife habitats that have been confirmed to be significant through the completion of the evaluation of significance, NRSI biologists have also identified several other wildlife habitats that could be considered to be significant, but require additional

studies. For the purpose of this report, these habitats will be treated as significant with a commitment for additional pre-construction surveys to be undertaken during the appropriate season prior to any construction activities.

Wildlife habitats that have been treated as significant for the purposes of this EIS include 17 specific habitats, representing 3 different wildlife habitat types. These specific habitats, described in Table 10, include 1 raptor wintering area, 13 bat maternity colonies, and 3 amphibian breeding habitats (woodland). Following the completion of the additional pre-construction surveys (described below), any feature determined to be significant, based on a comparison of data to provincial standards, will require the mitigation measures and contingency plans (if needed) described below to be applied to that specific feature. Following the completion of these pre-construction surveys, a memo, letter, or abbreviated report will be prepared and submitted to the Ministry of Natural Resources. These memos will provide all the necessary information, as outlined by NHA regulations and guidance material, outlining the methods and results of the study and how the results have been compared to provincial guidance documents to assess the significance. The results of all pre-construction surveys will be related to the evaluation criteria outlined in the *Bornish Wind Energy Centre: Natural Heritage Evaluation of Significance Report* to determine if each habitat surveyed meets provincial criteria for being considered significant.

**Table 10. Potential Impacts, Mitigation Measures, and Survey Methods for Wildlife Habitats that have been Presumed Significant**

Feature ID	Distance to Project Location	Potential Negative Effects	Pre-construction Surveys	Mitigation Measures (if significant)	Performance Objectives, Monitoring, and Contingency Plans
BMA 008 BMA 009 BMA 010 BMA 011 BMA 016 BMA 017 Bat Maternity Colony	0-30m	<ul style="list-style-type: none"> <li>Accidental damage to vegetation, including tree limbs</li> <li>Noise disturbance and/or avoidance behaviour during construction</li> <li>Avoidance caused by lighting</li> </ul>	<p>Surveys will be in accordance with Bats and Bat Habitats (OMNR 2011).</p> <p>A single 1.5hr visual point count surveys at each of up to 10 snags for woodlands &lt;10ha, and an additional snag for each additional hectare of size (to a maximum of 35).</p> <p>Surveys will be conducted during the month of June, on nights with suitable weather conditions.</p> <p>Site specific bat surveys are dependent on receiving site access for each of these features. If site access is not available, possible alternative methods will be discussed with the MNR.</p>	<ul style="list-style-type: none"> <li>Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant bat roosting trees</li> <li>Impacts are expected to be minimal, and temporary, in nature, and no specific mitigation measures have been determined necessary.</li> <li>Propose a lighting scheme to that will minimize potential risk to bat collisions while fulfilling Transport Canada requirements</li> </ul>	<p><b>Performance Objective:</b></p> <ul style="list-style-type: none"> <li>Protection of bat roosting habitat</li> </ul> <p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>Conduct post-construction monitoring of this feature for 3 years after construction, following pre-construction methods, for all features deemed significant.</li> </ul> <p><b>Contingency Measure:</b></p> <ul style="list-style-type: none"> <li>If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed.</li> </ul>
AWO 001 AWO 002 AWO 003 Amphibian Breeding Habitat	0-30m	<ul style="list-style-type: none"> <li>Accidental damage to vegetation, including tree limbs and root zones</li> </ul>	<p>Two daytime visits to conduct salamander egg mass surveys within areas of standing water. The first visit will occur after the first warm rain in</p>	<ul style="list-style-type: none"> <li>Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to the woodland edge.</li> </ul>	<p><b>Performance Objective:</b></p> <ul style="list-style-type: none"> <li>Direct habitat protection and minimize amphibian mortality</li> </ul>

(Woodland)		<ul style="list-style-type: none"> <li>Noise disturbance and/or avoidance behaviour</li> </ul>	<p>March with the second visit occurring in conjunction with the first call survey to be completed in April (see below).</p> <p>Three (3) evening amphibian call surveys (depending on site access), occurring once in each of April, May and June. Each survey will last 3 minutes, following accepted Marsh Monitoring Program protocol.</p> <p>During each survey, biologists will record species and calling abundance codes, along with other appropriate information (date, time, weather, etc.), as well as identify any amphibian movement corridors.</p>	<ul style="list-style-type: none"> <li>Impacts are expected to be minimal, and temporary, in nature, and no specific mitigation measures have been determined necessary.</li> </ul>	<p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>Conduct post-construction amphibian call surveys for 1 year to assess any potential changes in amphibian breeding populations or species distribution.</li> <li>Conduct post-construction visual assessments of access roads to look for amphibian mortalities to determine if amphibian populations are being impacted by increased traffic associated with access roads.</li> </ul> <p><b>Contingency Measure:</b></p> <ul style="list-style-type: none"> <li>If the results of the monitoring indicate a feature is no longer significant, the MNR will be consulted to discuss the need (if any) for additional post-construction surveys.</li> </ul>
		<ul style="list-style-type: none"> <li>Sedimentation and erosion</li> </ul>		<ul style="list-style-type: none"> <li>Implement a sediment and erosion control plan,</li> <li>Install, monitor, and maintain erosion and sediment control measures (i.e. silt fences) around the construction area</li> <li>Maintain or restore vegetated buffers, including riparian zones</li> </ul>	
		<ul style="list-style-type: none"> <li>Changes in surface hydrology</li> </ul>		<ul style="list-style-type: none"> <li>Limit changes in land contours,</li> <li>Maintain streams and timing and quantity of flow,</li> </ul>	
		<ul style="list-style-type: none"> <li>Direct mortality of dispersing amphibians along access roads</li> </ul>		<ul style="list-style-type: none"> <li>Post speed limits along construction access roads, and maintain signage during the operational phase of the project</li> </ul>	
		<ul style="list-style-type: none"> <li>Behavioural avoidance of roads due to barrier effect</li> </ul>		<ul style="list-style-type: none"> <li>Where a significant amphibian movement corridor is identified during pre-construction surveys an appropriately sized culvert will be installed to enable continued movement of amphibians</li> </ul>	
BMA 013 Bat Maternity Colony	30-120m	<ul style="list-style-type: none"> <li>Noise disturbance and/or avoidance behaviour during construction</li> </ul>	Same as Bat Maternity Habitat methods described above.	<ul style="list-style-type: none"> <li>Construction activities will not occur within 30m of this habitat.</li> </ul>	<p><b>Performance Objective:</b></p> <ul style="list-style-type: none"> <li>Protection of bat roosting habitat</li> </ul> <p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>Conduct post-construction monitoring of this feature for 1 year after construction,</li> </ul>
		<ul style="list-style-type: none"> <li>Avoidance caused by lighting</li> </ul>		<ul style="list-style-type: none"> <li>Propose a lighting scheme to that will minimize potential risk to bat collisions while fulfilling</li> </ul>	

				Transport Canada requirements	<p>following pre-construction methods</p> <ul style="list-style-type: none"> <li>If monitoring indicates that this feature is no longer significant, an additional 2 years of post-construction acoustic monitoring will occur following pre-construction methods.</li> </ul> <p><b>Contingency Measure:</b></p> <ul style="list-style-type: none"> <li>If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed.</li> </ul>
RWA 002 Raptor Wintering Area	0-30m access road and underground utility line  30-120m turbine	<ul style="list-style-type: none"> <li>Noise disturbance and/or avoidance behaviour during construction</li> </ul>	Thirty minute visual raptor surveys focused on identifying raptors along woodland/update edge habitat. Surveys will be conducted on 3 visits in January 2012, with another 3 visits occurring in February 2012 (depending on January results).	<ul style="list-style-type: none"> <li>No project components with potential operational impacts will be placed within 30m of this habitat</li> </ul>	<p><b>Performance Objective:</b></p> <ul style="list-style-type: none"> <li>Protection of raptor wintering area habitat</li> <li>Limit disturbance to raptors overwintering within the project area.</li> </ul> <p><b>Monitoring:</b></p> <ul style="list-style-type: none"> <li>Conduct post-construction surveys of this wildlife habitat for 1 year after construction, following pre-construction methods.</li> <li>If visual surveys indicate that there is an avoidance effect an additional 2 years of post-construction acoustic monitoring will occur following pre-construction methods. The need to conduct an additional 2 years of monitoring will be</li> </ul>
		<ul style="list-style-type: none"> <li>Avoidance of habitat during operation phase</li> </ul>		<ul style="list-style-type: none"> <li>Unknown avoidance caused by operation of turbines in proximity to raptor wintering habitat . No mitigation proposed as impacts are anticipated to be minimal.(turbine located 93m away)</li> </ul>	

					determined in consultation with MNR. <b>Contingency Measures:</b> MNR will be consulted to determine contingency measures
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#### 7.3.4 Generalized Impacts to Wildlife Habitat

In addition to the series of wildlife habitats identified above, NRSI biologists have also identified a number of wildlife habitat types that may be present within the Bornish Wind Energy Centre project area, but are located within 120m of project components that are not expected to have an operational impact on these habitats. In accordance with the Natural Heritage Assessment Guide (OMNR 2011a), potential impacts to these habitats are typically associated with the temporary disturbance of construction activity and can be grouped together as generalized impacts and mitigation measures.

NRSI biologists have reviewed the full suite of wildlife habitats that require generalized consideration, and have compiled a comprehensive list of mitigation measures that will be implemented during the construction and decommissioning phases in Table 11.

**Table 11. Summary of Potential Effects and Mitigation Measures for Generalized Wildlife Habitat during the Construction and Decommissioning Phases of the Bornish Wind Energy Centre**

Project Component	Project Activity	Potential Negative Effects	Mitigation Measures	Objectives, Monitoring, and Contingency Plans
Wind Turbine Erection	Clearing, grubbing, grading, and topsoil removal.	<ul style="list-style-type: none"> <li>Increased erosion and sedimentation into woodlands, wetlands, and other natural features,</li> <li>Soil compaction</li> </ul>	<ul style="list-style-type: none"> <li>Develop and implement an erosion and sediment control plan,</li> <li>Utilize erosion blankets, silt fencing, straw bales, etc. for construction activities within 30m of a wetland, woodland, or water body,</li> <li>Maintain erosion control measures for the duration of construction or decommissioning activities,</li> <li>Any stockpiled material will be stored more than 30m from a wetland, woodland, or water body,</li> <li>Minimize vehicle traffic on exposed soils, and limit heavy machinery traffic on sensitive slopes.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize direct impacts on vegetation communities and protect rare/sensitive habitats,</li> <li>Maintain vegetated buffers, particularly within riparian zones,</li> <li>Minimize the impacts of sedimentation on nearby natural features</li> </ul>
	Noise/human activity.	<ul style="list-style-type: none"> <li>Disturbance and/or mortality to local wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>Clearly post construction speed limits.</li> </ul>	<ul style="list-style-type: none"> <li>Limit potential wildlife road mortalities</li> </ul>
	Accidental damage to vegetation.	<ul style="list-style-type: none"> <li>Damage or removal of vegetation adjacent to the project location.</li> </ul>	<ul style="list-style-type: none"> <li>Where construction activity occurs within 30m of a naturally vegetated feature (i.e. woodland, wetland, etc.), the construction area should be clearly delineated with protective fencing, such as silt fencing,</li> <li>Damaged trees should be pruned through implementation of proper arboricultural techniques.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize impacts to natural vegetation</li> </ul>
	Chemical spills or accidental fluid release (i.e. oil, gasoline, grease, etc.).	<ul style="list-style-type: none"> <li>Soil or water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a spill response plan and train staff on appropriate procedures,</li> <li>Keep emergency spill kits on site,</li> <li>Vehicle washing, refueling stations, and chemical storage will all be located more than 30m from natural features or water bodies,</li> <li>Dispose of waste material by authorized and approved offsite vendors.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize impacts to natural features and wildlife habitats,</li> <li>Avoid contamination of water or wetland features</li> </ul>
	Dewatering activities (if necessary)	<ul style="list-style-type: none"> <li>Reduced stream flow rate,</li> <li>Increased water temperature.</li> </ul>	<ul style="list-style-type: none"> <li>Control rate and timing of water pumping,</li> <li>Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands,</li> <li>Restrict taking of water during periods of extreme</li> </ul>	<ul style="list-style-type: none"> <li>Maintain ground and surface water conditions with those near pre-construction conditions</li> </ul>