

# Natural Heritage Assessment

## Evaluation of Significance

### Report

#### Kingston Gardiner TS Unity Road

#### Solar Energy Project

prepared for

Axio Power Canada Inc.

DRAFT



**ECOLOGICAL SERVICES**

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## 1.0 INTRODUCTION

### 1.1 Project Description

Axio Power Canada Inc. (Axio Power) is proposing to develop a 10 megawatt solar photovoltaic project titled Kingston Gardiner TS Unity Road Solar Energy Project. The Project Location<sup>1</sup> is a 34 hectare (ha) parcel situated on Pt Lot 12 Concession 6, within the City of Kingston (single tier municipality) County of Frontenac and within Madoc Ecodistrict 6E-9 (Figure 1.1). The longitude and latitude are 44° 19' 33.88" and 76° 33' 54.87".

### 1.1 Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. Ground-mounted solar facilities with a nameplate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require a REA in accordance with Section 4 of O. Reg. 359/09. Subsection 24 (1) of O. Reg. 359/09 requires proponents of Class 3 solar projects to undertake a natural heritage assessment consisting of a records review report, site investigation report and an evaluation of significance report for each natural feature identified during the natural heritage records review and site investigation.

Natural features are defined in subsection 1 (1) of O. Reg. 359/09 to be all or part of:

- a) an area of natural and scientific interest (ANSI) (earth science)
- b) an ANSI (life science)
- c) a coastal wetland
- d) a northern wetland
- e) a southern wetland
- f) a valleyland
- g) a wildlife habitat, or
- h) a woodland.

The *Natural Heritage Assessment Records Review Report (NHARR)* Hatch Ltd., 2011a) and *Natural Heritage Assessment Site Investigation Report (SI)* (Ecological Services, 2011) did not identify any ANSI's, wetlands or valleylands on or within 120 m of the Project Location. However, there were confirmed significant woodlands (Hatch Ltd., 2011a) and candidate significant wildlife habitat (Ecological Services, 2011) on and within 120 m of the Project Location that will need to be evaluated to determine significance.

<sup>1</sup> "Project Location means, when used in relation to a renewable energy project, 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 proposed to engage in the project" (O. Reg. 359/09, s. 1 (1)).

### ***1.2.1 Natural Heritage Assessment Evaluation of Significance Report (EOS)***

Section 27 of the REA Regulation requires proponents of Class 3 solar projects to prepare a *Natural Heritage Assessment Evaluation of Significance Report (EOS)* for natural features identified in the *NHARR* (Hatch, 2011a) and *SI* (Ecological Services, 2011) that sets out:

- a determination of whether the natural feature is:
  - provincially significant or not provincially significant (i.e. wetlands and ANSI's)
  - significant or not significant (i.e. woodland, valleyland or wildlife habitat)
- summary of the evaluation criteria or procedures used to make the determination
- the name and qualifications of any person who applied to evaluation criteria or procedures.

This report has been prepared to meet these requirements. A map showing the boundaries of the significant natural features identified in this report (Figure 3.1) has also been prepared. As mentioned in Section 1.2, there are no wetlands or ANSI's on or within 120 m of the Project Location. Therefore, an evaluation to determine if these features are provincially or non-provincially significant is not required. However, there are confirmed significant woodlands and candidate significant wildlife identified on and within 120 m of the Project Location that will be evaluated to determine significance. Although the municipality has confirmed the presence of significant woodlands on and within 120 m of the Project Location, these woodlands will be evaluated to reflect the information obtained during the site investigation (Ecological Services, 2011).

## 2.0 EVALUATION OF CANDIDATE SIGNIFICANT NATURAL FEATURES

### 2.1 Candidate Significant Woodlands

The *NHARR* (Hatch Ltd., 2011a) identified woodland on and within 120 m of the Project Location that have been designated as significant in the natural heritage assessment of the region by the Cataraqui Region Conservation Authority (CRCA 2006). The following evaluation will assess these woodlands based upon the significance criteria given in Section 7 of the *Natural Heritage Reference Manual* (MNR, 2010).

Woodlands are defined in subsection 1 (1) of the REA Regulation as:

a) land that is south and east of the Canadian Shield

b) land that has per hectare, at least

1. 1000 trees of any size
2. 750 trees measuring over 5 cm in diameter
3. 500 trees measuring over 12 cm in diameter
4. 250 trees measuring over 20 cm in diameter

c) land that does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.

A tree inventory prepared by a registered forester for Axio confirmed that there are woodlands within 120 m of the Project Location that meet the REA criteria for tree stocking density. The boundaries of the woodland identified in Figure 3.1 were delineated based on observations made during the site investigations and air photo interpretation and follow the REA criteria for woodland. As a result the LIO woodland mapping shown in the *NHARR* (Hatch Ltd., 2011a) requires minor revisions to the boundaries of these features.

The criteria for establishing woodland significance are identified in Section 7 of the *Natural Heritage Reference Manual* (*NHRM*) (Ontario Ministry of Natural Resources (MNR), 2010a) and in the *Natural Heritage Assessment Guidelines for Renewable Energy Projects* (MNR, 2010b). Woodlands that meet a suggested minimum standard set out in the *NHRM* (MNR, 2010) for any one of the criteria is considered significant. According to Henson and Brodribb (2005), the Madoc Ecodistrict 6E-9 has approx. 69% natural area coverage, of which most is forest. Satellite image analysis (Google Earth, LIO mapping) of the Kingston municipal region north of Hwy 401 confirms that woodlands cover >60% and this is the size baseline that will be applied to the assessment criteria categories.

**Woodland 1:** Both parts of Woodland 1 (a and b) shown on Figure 3.1 are part of the same woodland that extends beyond the 120 m adjacent lands

- **Woodland size** – Under *NHRM* guidelines (MNR, 2010b), a minimum woodland size criterion is not applied to municipalities in which forest cover is >60%. As *Woodland 1* is within a Site Region in which forest cover is >60%, it will not be assessed for size.
- **Ecological function**
  - *Woodland interior* – Where woodlands represent >60% of the land cover, 20 ha or more of interior habitat is considered significant (MNR, 2010). Woodland interior habitat is typically defined as habitat more than 100 m from a defined edge. The amount of interior woodland

habitat found *Woodland 1(a)* is 9 ha or 10% of the approx. 90 ha of woodland interior contained within the larger 270 ha woodland associated with the Project Location (Appendix A). The woodland interior criterion has therefore been met.

- *Proximity to other significant natural features* – Woodlands >50 ha in size within 30 m of a significant natural feature receiving ecological benefit from the woodland are considered significant (MNR, 2010b). *Woodland 1* is part of a 270 ha woodland that provides wildlife habitat (*habitat for species of conservation concern*) and has been identified as significant woodland by CRCA. Accordingly, this criterion has been met.
- *Linkages* – Woodlands >50 ha in size and providing a connecting link between two other significant features (i.e. within 120 m) are considered significant (MNR, 2010b). *Woodland 1* provides linkages between other identified significant woodlands. Therefore, this criterion has been met.
- *Water protection* – Woodlands >4 ha within 50 m of a water feature (e.g. groundwater discharge / recharge area, headwater area, watercourse) are considered significant (MNR, 2010b). As *Woodland 1* is not within 50 m of a water feature, this criterion has not been met.
- *Woodland diversity* – A woodland is considered significant if it has: a naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield and meet minimum area thresholds, a high native diversity through a combination of composition and terrain (e.g., a woodland extending from hilltop to valley bottom or to opposite slopes) and meets minimum area thresholds (i.e., 20 ha) (MNR, 2010b). *Woodland 1* does not include native stand types of conservation value, therefore this criterion is not considered to have been met.
- *Uncommon characteristics* – Woodlands >10 ha that include provincially rare plant species or vegetation communities (i.e. S-rank: S1 to S3) and/or old-growth trees (i.e., 10 or more trees / ha greater than 100 years old) are considered significant (MNR, 2010). No provincially rare species or communities were encountered within *Woodland 1*. This criterion is not considered to have been met.
- *Economic and social functional values* – Woodlands with high economic or social values (e.g. air-quality improvement, recreation, education, cultural and historical value) are considered significant (MNR, 2010a). *Woodland 1* is not used for any significant or recognized economic or social functions, other than for occasional hunting purposes by the landowner. Therefore, this criterion has not been met.

## **Woodland 2**

- **Woodland size** – According to the *NHRM* (MNR, 2010), a minimum woodland size criterion is not applicable in regions in which forest cover is >60%. Therefore, this criterion will not be applied.
- **Ecological function**
  - *Woodland interior* – No interior habitat occurs within *Woodland 2*. The criterion has therefore not been met.

- *Proximity to significant woodlands or habitats* –Woodland 2 is within 30 m of *wildlife habitat* that has been identified as significant in this *EOS*, but it does not meet the minimum area requirement of 50 ha. Accordingly, this criterion has not been met.
- *Linkages* –Woodland 2 is within 120 m of significant woodlands, but it does not meet the minimum area requirement of 50 ha. This criterion has therefore not been met.
- *Water protection* – Woodland 2 is not within 50 m of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat. This criterion has not been met.
- *Woodland diversity* – Woodland 2 does not include native stand types of conservation value and does not meet the minimum area requirement of 20 ha. This criterion has not been met.
- *Uncommon characteristics* –No provincially rare species or communities or old growth features are found within *Woodland 2*. This criterion has not been met.
- *Economic and social functional values* –Woodland 2 does not provide significant economic or social function values. This criterion has not been met.

### **Woodland 3**

- **Woodland size** – According to the *NHRM* (MNR, 2010), a minimum woodland size criterion is not applied in municipal regions in which forest cover is >60%. Therefore, this criterion will not be applied.
- **Ecological function**
  - *Woodland interior* – Woodland 3 does not contain interior habitat and does not meet the minimum area requirement of 20 ha for this region. The woodland interior criterion has therefore not been met.
  - *Proximity to significant woodlands or habitats* –Woodland 3 is within 30 m of *wildlife habitat* that has been identified as significant in this *EOS*, but does not meet the minimum area requirement of 50 ha. Accordingly, this criterion has not been met.
  - *Linkages* –Woodland 3 within 120 m of other significant woodlands but does not meet the minimum area requirement of 50 ha. Accordingly, this criterion has not been met.
  - *Water protection* – Woodland 3 is not within 50 m of a water body. This criterion has therefore not been met.
  - *Woodland diversity* – Woodland 3 is part of a 17 ha woodland that includes native mixed stands that are of conservation concern, but does not meet the minimum area requirement of 20 ha. Accordingly, this criterion has not been met.
  - *Uncommon characteristics* –No provincially rare species or communities or old growth features are found within *Woodland 3*. This criterion has not been met.

- *Economic and social functional values* –Woodland 3 does not provide significant economic or social function values. Therefore, this criterion has not been met.

**Evaluation** – To be considered significant woodland, at least one of the above **NHRM** evaluation criteria must be met. The EOS determined that of the 3 woodlands identified on and within 120 m of the Project Location, Woodland 1 meets 1 or more of these criteria (interior habitat, proximity to other significant woodlands or habitats, and linkages). Accordingly, Woodland 1 has been evaluated as significant and will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* as the proposed development is within 120 m of this natural feature.

## 2.2 Candidate Significant Wildlife Habitat

Wildlife habitat assessment guidelines indicated in the *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (MNR, 2009b)* for Site Region 6E identifies 5 main types of wildlife habitat that can be classified as significant: seasonal concentrations areas, rare vegetation communities, specialized habitats for wildlife, habitats of species of conservation concern, and animal movement corridors. Within each of these 5 types of wildlife habitat are specific habitat types to reflect the life history requirements of an individual or group of species.

The criteria that were considered during this evaluation and how they were assessed are discussed for each of the candidate significant habitat types for the candidate significant wildlife habitat features (*seasonal concentration areas* and *habitat of species of conservation concern*) identified in the **SI** (Ecological Services, 2011).

### 2.2.1 Seasonal Concentration Areas

Specific criteria used to evaluate *seasonal concentration areas* are identified in Tables Q-1 (and Q-2), Appendix Q in the **SWHTG** (MNR, 2000). The *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (MNR, 2009b)* was also used to supplement information obtained in the SWHTG (MNR, 2000). The criteria that were considered during this evaluation and how they were assessed are discussed for the candidate significant habitat identified in the **SI** (Ecological Services, 2011).

#### 2.2.1.1 Raptor Wintering Areas

For Site Region 6E this wildlife habitat feature should provide a combination of fields and woodlands >20 ha in size that provides roosting, foraging, and resting habitats for wintering raptors. Studies will confirm the use of these habitats over the winter period by observing 1 or more Short-eared Owls or 2 or more listed spp. (Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, or Snowy Owl) with 10 or more individuals. To be significant a site must be used annually for a minimum of 20 days by the above number of birds. Significant sites are generally the only known sites in the planning area; significant sites may be one of only a few in the area.

Most of the Project Location and 120 adjacent lands consist of young red cedar woodlands and open thicket habitats that potentially provide foraging habitat for woodland raptors. On April 3, 2011, a Northern Harrier was observed hunting within an open thicket area on the Project Location prior to moving onto adjacent property to the east. According to Weir (2008), migrating Northern Harriers return to the Kingston region on March 11 (55 year average), although some individuals are known to overwinter on Wolfe and Amherst Islands, where there is abundant prey within large expanses of open meadow. These islands are the only

recognized sites in the Kingston region that provide significant overwintering habitat for a number of raptor species (Weir, 2008). As the Unity Road Project Location is >12 km inland from Lake Ontario, it is almost certain that the Northern Harrier observed on the Project Location was a migrant.

**Evaluation:** As habitat within 120 m of the Project Location is of similar type, age and form to that found across most of the local region, and only a single observation was made of a raptor during the March and April 2011 site investigations, significant habitat for wintering raptors is not considered to be present. This feature will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess potential negative environmental effects.

### 2.2.1.2 Amphibian Breeding Habitat

The *SI* (Ecological Services, 2011) identified candidate significant amphibian breeding habitat within a shallow vernal pool located within a stand of young green ash and shrub. On April 9, 2011, approx. 30-40 chorus frogs were heard calling from this location. This feature lies to the southwest of the Project Location mainly within 120 m adjacent lands, although the eastern edge of the pond is 4 m from a planned access road. Table 2.1 below presents the evaluation determinations of this site in terms of the *SWHTG* criteria used to establish significance for woodlands supporting amphibian breeding ponds.

**Table 2.1 Evaluation criteria for candidate significant amphibian breeding habitat.**

Criterion	Requirements	Description of Amphibian Breeding Habitat Features from <i>SI</i>	Criterion Met
Provision of significant wildlife habitat	<ul style="list-style-type: none"> <li>Presence of a wetland, lake, or pond within or adjacent (within 120m) to a woodland</li> <li>Woodlands providing several significant wildlife habitats (e.g., forest interior habitat, raptor nesting, abundant tree cavities and down woody debris) are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>The young woodland encompassing the breeding site lacks interior habitat and down woody debris</li> </ul>	
Degree of permanence	<ul style="list-style-type: none"> <li>Woodlands with permanent ponds or those containing water in most years until at least mid July are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>The feature is formed by seasonal flooding and does not persist into summer</li> </ul>	
Species diversity of pond	<ul style="list-style-type: none"> <li>Ponds supporting high species diversity are more significant</li> <li>At least 2 species with a minimum of 20 individuals</li> </ul>	<ul style="list-style-type: none"> <li>1 species of frog (chorus frog) noted</li> <li>Approx. 30 to 49 individuals at each habitat feature</li> </ul>	
Presence of rare species	<ul style="list-style-type: none"> <li>Ponds supporting rare amphibian species are more significant than ponds supporting only common species.</li> </ul>	<ul style="list-style-type: none"> <li>Although not determined through genetic analysis, observed chorus frogs may be the more common <i>Pseudacris maculate</i> (<i>S.Lougheed, pers. comm. Queen's University</i>)</li> </ul>	
Size and number of ponds	<ul style="list-style-type: none"> <li>In general, woodlands with larger and/or several ponds are more significant</li> </ul>	<ul style="list-style-type: none"> <li>Site is &lt;0.1 ha in size</li> </ul>	
Diversity of submergent and emergent vegetation	<ul style="list-style-type: none"> <li>Ponds with a good diversity of emergent and submergent aquatic vegetation are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>None aquatic vegetation present as feature is temporary.</li> </ul>	

Presence of shrubs, logs at edge of pond	<ul style="list-style-type: none"> <li>• Presence of shrubs and logs increase significance of pond for some amphibian species because of increased structure for calling, foraging, and escape and concealment from predators.</li> </ul>	<ul style="list-style-type: none"> <li>• No shrubs and logs evident</li> </ul>	
Adjacent forest habitat	<ul style="list-style-type: none"> <li>• More significant areas will have closed canopy forest providing shaded, moist understory and abundance of down woody debris for cover habitat.</li> <li>• Breeding ponds with shortest distance to forest habitat are more significant because of reduced risk to moving amphibians and are more likely to be used.</li> </ul>	<ul style="list-style-type: none"> <li>• A small stand of shaded, moist forest encloses the feature, but open red cedar woodlands surround this stand</li> <li>• No down woody debris as stand is very young</li> </ul>	√
Water quality	<ul style="list-style-type: none"> <li>• Prefer unpolluted waters.</li> </ul>	<ul style="list-style-type: none"> <li>• Woodland sites appears clean</li> </ul>	√
Level of disturbance	<ul style="list-style-type: none"> <li>• Woodlands with little or no disturbance (e.g., forest management, roads between breeding pond and forest habitat) are more significant.</li> </ul>	<ul style="list-style-type: none"> <li>• Woodland is situated behind a residential home and there is some evidence of trails and yard debris nearby</li> </ul>	

**Evaluation** – Although some of the habitat criteria have been met for this feature, its small size, seasonality, and low diversity are important considerations in determining significance. In addition, based on our experience in this region, the species noted (chorus frogs) do not appear to require specialized breeding habitat, as they are commonly encountered along rural road verges and grass swales within hayfields. For example, during the *SI* high numbers of chorus frogs were also heard calling from a flooded ditch along Unity Road and from a shallow pond within the aggregate quarry to the southeast of the Project Location. Although recognized as amphibian breeding areas, these features do not constitute *significant* wildlife habitat. Accordingly, the amphibian breeding pond located within 120 m of the Project Location will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess potential negative environmental effects. *Note: as 90% of this vernal pond occurs outside of the Project Location, there will be minimal encroachment onto this feature.*

### 2.2.2 Specialized Habitats for Wildlife

Criteria used to evaluate *specialized habitats for wildlife* are identified in Table Q-3 of Appendix Q in the *SWHTG* (MNR, 2000). The *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* (MNR, 2009b) was also used to supplement information obtained in the *SWHTG* (MNR, 2000). The criteria that were considered during this evaluation and how they were assessed are discussed for each of the candidate significant habitats of species of conservation concern identified in the *SI* (Ecological Services 2011).

#### 2.2.2.1 Woodland Raptor Nesting Habitat

Several species of raptors, and those nesting and hunting in forests and grasslands require somewhat specialised nesting habitat for their long-term survival. For Site Region 6E, these include all natural or conifer plantation forest stands >10 ha in size of intermediate to mature age. Characteristics of the 3 woodlands found within 120 m of the Project Location were considered in relation to their potential to provide raptor nesting habitat. Woodlands on the Project Location are comprised of young red cedar woodland with a small (<1 ha) patch of conifer plantation. There are approx. 90 ha of interior habitat present within the larger woodland to

the northeast of the Project Location. Woodland to the south of the Project Location contains very little interior habitat, but is a more mature mixed forest stand. No nests or breeding raptors were encountered during the site investigations. One raptor (Northern Harrier) was encountered foraging within the Project Location in early March, 2011.

**Evaluation** – Woodlands associated with the Project Location are too young and patchy (i.e., lack an open understory and closed canopy) to provide candidate significant nesting habitat for woodland raptors. Woodlands to the south of the Project Location include more mature forest with taller trees, and an open understory; however, no nesting raptors were encountered on or within 120 m of the Project Location during site investigations in the spring of 2010 and 2011. Accordingly, *significant woodland raptor nesting habitat* will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess potential negative environmental effects.

### **2.2.3 Habitat of Species of Conservation Concern**

Criteria used to evaluate *habitat of species of conservation concern* are identified in Table Q-3 of Appendix Q in the *SWHTG* (MNR, 2000). The *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (MNR, 2009b)* was also used to supplement information obtained in the *SWHTG* (MNR, 2000).

#### **2.2.3.1 Shrub/early successional bird breeding habitat**

Candidate significant breeding habitat for bird species that prefer shrub/early successional vegetation communities was identified in the *SI* on and within 120 m of the Project Location. These areas of cultural thicket (CUT) consist of red cedar dominated patches of successional growth on abandoned pasture. There are 20 ha of thicket community present within 120 m of the Project Location occurring as 4 separate patches. However these communities are contiguous with shrub thicket extending for several hundred hectares across adjacent lands.

Table 2.2 below presents the evaluation of *shrub/early successional breeding habitat* found on and within 120 m of the Project Location based upon criteria presented in the *Ecoregion Criteria Schedules* (MNR 2009b).

**Table 2.2 Evaluation criteria for candidate significant shrub/successional bird breeding habitat identified in the SI.**

<b>Criterion</b>	<b>Requirements from SWHTG Ecoregion Criteria Schedules (MNR 2009b)</b>	<b>Description of Open Country Bird Breeding Habitat</b>	<b>Criterion Met</b>
Presence of indicator species and species of conservation concern	<ul style="list-style-type: none"> <li>presence of nesting or breeding of 2 or more indicator (Brown Thrasher, Clay-coloured Sparrow) or special concern species (Yellow-breasted Chat, Golden-winged Warbler) and at least 1 of the common species (Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher, or Blue-winged Warbler). A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Both indicator and common shrubland species observed within 120 m of Project Location (Alder Flycatcher, Willow Flycatcher, Brown Thrasher, and Clay-coloured Sparrow, Field Sparrow, Eastern Towhee)</li> </ul>	√
Overall area	<ul style="list-style-type: none"> <li>Shrubland or successional areas &gt;30 ha</li> </ul>	<ul style="list-style-type: none"> <li>Contiguous shrub thicket communities of several hundred ha are contiguous with those found within the Project Location</li> </ul>	√
Land Use History	<ul style="list-style-type: none"> <li>sites considered significant should have a history of longevity (i.e., not actively farmed in last 5 years).</li> </ul>	<ul style="list-style-type: none"> <li>Shrub thicket communities present for &gt;5 years</li> </ul>	√
Site Disturbance	<ul style="list-style-type: none"> <li>Should be free from human disturbance and not in close proximity to residential areas or transportation corridors</li> </ul>	<ul style="list-style-type: none"> <li>Generally undisturbed</li> </ul>	√

***Evaluation – Shrub/early successional bird breeding habitat is present on and within 120 m of the Project Location. Accordingly, this feature will be carried forward to the Natural Heritage Assessment Environmental Impact Study Report.***

#### *2.2.3.2 Special concern and S1-S3 species and communities (milksnake, juniper hairstreak)*

In the *SI* report (Ecological Services, 2011), candidate habitat potentially supportive of an S1-S3 species (juniper hairstreak, milksnake) was identified for the areas encompassed by the Project Location and 120 m adjacent lands. Table 2.3 below presents the evaluation of habitat found on and within 120 m of the Project Location for each of these species based upon criteria presented in Table Q3 of Appendix **SWHTG** (MNR, 2000).

**Table 2.3. Evaluation criteria for candidate significant habitat for species of special concern and S1-S3 species (milksnake) identified in the SI.**

Criterion	Requirements from SWHTG Ecoregion Criteria Schedules (MNR 2009b)	Evaluation of Habitat	Criterion Met
Degree of rarity of species found at site	<ul style="list-style-type: none"> <li>• Habitats of the rarest species are more significant than those of less rare species.</li> <li>• Species ranked as vulnerable by the OMNR should also be considered significant.</li> <li>• Less rare species and their habitats in the planning area may be deemed species of conservation concern</li> <li>• If a species' habitat is to be protected, sufficient area (based on the species' known requirements) should be retained to ensure a viable and sustainable population.</li> </ul>	<ul style="list-style-type: none"> <li>• Milksnakes are an S3 species of special concern</li> <li>• Habitat generalists occupying range of habitat types in eastern Ontario often in close association with rural farms and outbuildings</li> <li>• Herpetofaunal summary atlas shows species records distributed across southern Ontario</li> </ul>	√
Documented significant decline in a species and/or its critical habitat	<ul style="list-style-type: none"> <li>• Habitat for species experiencing the greatest declines is most significant.</li> <li>• Habitat for declining species that has the lowest representation in the planning area is more significant.</li> <li>• Habitats that provide the best opportunity for the long-term sustainability of the declining species are most significant (e.g., large well-protected sites; sites that best meet the species' habitat requirements; sites with good connections to other similar habitats).</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat on site includes range of woodlands and early successional habitat that is prevalent across the region in terms of representation and connectivity</li> <li>• Critical habitat recognized as hibernacula, which was not identified on site</li> <li>• no population estimates available for Quebec or Ontario. Ontario records suggest maintained much of its historical range, although the species likely been extirpated from some large urban centres or areas of intensive agricultural use where habitat has been lost</li> </ul>	
Species whose range is solely or primarily found in Ontario (i.e., provincial responsibility)	<ul style="list-style-type: none"> <li>• Habitat for those species with the poorest representation within the planning area is more significant.</li> <li>• Species and their habitats are significant even if well represented in the planning area, due to high provincial responsibility for their protection.</li> <li>• Those habitats that provide the best opportunities for the long-term sustainability of the target species are most significant (e.g., large well protected sites; sites that best meet the species' habitat requirements; sites with good connections to other similar habitats).</li> </ul>	<ul style="list-style-type: none"> <li>• Milksnake populations range across eastern North America and are not confined to Ontario</li> </ul>	

<p>Condition of existing habitat at site</p>	<ul style="list-style-type: none"> <li>• Sites that provide habitat that best meets the survival requirements of the target species and that also include a natural buffer zone are most significant (i.e. most likely to sustain species/population over the long term).</li> <li>• Sites that contain the fewest non-native species of potential threat to the target species are significant.</li> <li>• Undisturbed or least-disturbed habitats (e.g., no/few deleterious impacts from roads, human activities) are significant.</li> <li>• Sites capable of producing a large number of individuals of a single species of conservation concern are significant.</li> <li>• Highly diverse sites that support one or more species of conservation concern are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>• Large area of contiguous woodlands and smaller areas of early successional habitat cross the Project Location and are relatively undisturbed.</li> <li>• No hibernacula encountered</li> </ul>	<p>√</p>
<p>Size of species population at site</p>	<ul style="list-style-type: none"> <li>• Habitats supporting large populations of a several species of conservation concern are most significant.</li> <li>• Habitat supporting large populations of a single species is significant.</li> </ul>	<ul style="list-style-type: none"> <li>• No milksnake encountered within 120 m of the Project Location</li> </ul>	
<p>Size and location of habitat</p>	<ul style="list-style-type: none"> <li>• Large sites supporting large populations of several species of conservation concern are most significant.</li> <li>• Large sites are generally more significant than most comparable but smaller sites.</li> <li>• Sites large enough to ensure long-term support and viability of species of conservation concern are significant. Sites with large areas of suitable habitat that are also connected to other potentially suitable habitat and/or natural areas are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>• General habitat potentially supportive of this species is found across the municipality and beyond</li> </ul>	<p>√</p>

<p>Potential for long-term protection of the habitat</p>	<ul style="list-style-type: none"> <li>Habitats that provide the best opportunity for long-term protection are usually more significant than similar habitats with little opportunity for protection or facing an uncertain future due to potential threats (e.g., habitat found in a large natural area vs. an isolated site close to an expanding residential development).</li> <li>Habitats threatened with degradation or loss are more significant than similar, but currently unthreatened habitats, if they can be protected.</li> <li>Habitats of species currently experiencing severe population declines in Ontario (e.g., grassland bird species) due to habitat loss are most significant.</li> <li>Habitats of species currently experiencing significant population declines in the municipality are significant.</li> </ul>	<ul style="list-style-type: none"> <li>Habitats occur on private lands – cannot predict future scenarios for development, but local region has been in successional recovery for &gt;50 years due to farm abandonment</li> </ul>	
<p>Representation of species/habitat within the municipality</p>	<ul style="list-style-type: none"> <li>Poorly represented habitats for species of conservation concern are significant.</li> <li>Habitats that could be lost or severely degraded and cannot be replaced by similar habitats in the planning area are highly significant.</li> </ul>	<ul style="list-style-type: none"> <li>Milksnake are habitat generalists, therefore able to use wide variety of habitat types common to the region</li> <li>Loss of hibernacula and road mortality are threats to population (Govt. of Canada 2010)</li> </ul>	
<p>Evidence of use of the habitat</p>	<ul style="list-style-type: none"> <li>Sites with documented traditional use by species are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>No documented use of Project Location by this species, but locally common</li> </ul>	<p>√</p>
<p>Species of particular interest to the planning authority (e.g., the CAC may recommend certain species such as indicator species)</p>	<ul style="list-style-type: none"> <li>Sites providing the best examples of habitat that will ensure the long term sustainability of the species are significant.</li> </ul>	<ul style="list-style-type: none"> <li>Generalized habitat regionally common</li> <li>Milksnake are not of particular interest to local planning authority (Loyalist Twp), other than as an SC species</li> </ul>	

**Evaluation** – Although neither milksnake nor snake hibernacula were found on or within 120 m of the Project Location, general foraging habitat was identified on and within 120 m of the Project Location. These habitats are common to the region, and the species is recognized as a habitat generalist. **Milksnake habitat is considered to be significant and will be carried forward to the Natural Heritage Assessment Environmental Impact Study Report.**

**Table 2.4. Evaluation criteria for candidate significant habitat for species of special concern and S1-S3 species (juniper hairstreak) identified in the SI.**

Criterion	Requirements from SWHTG Ecoregion Criteria Schedules (MNR 2009b)	Evaluation of Habitat	Criterion Met
Degree of rarity of species found at site	<ul style="list-style-type: none"> <li>• Habitats of the rarest species are more significant than those of less rare species.</li> <li>• Species ranked as vulnerable by the OMNR should also be considered significant.</li> <li>• Less rare species and their habitats in the planning area may be deemed species of conservation concern</li> <li>• If a species' habitat is to be protected, sufficient area (based on the species' known requirements) should be retained to ensure a viable and sustainable population.</li> </ul>	<ul style="list-style-type: none"> <li>• Juniper hairstreak are an S2 species of special concern</li> <li>• locally common in eastern Ontario (Govt' of Canada, 2010)2010</li> <li>• NHIC indicates populations known for Frontenac Co.</li> <li>• 2010 records show 1 observation for region (Poland, 2010)</li> </ul>	√
Documented significant decline in a species and/or its critical habitat	<ul style="list-style-type: none"> <li>• Habitat for species experiencing the greatest declines is most significant.</li> <li>• Habitat for declining species that has the lowest representation in the planning area is more significant.</li> <li>• Habitats that provide the best opportunity for the long-term sustainability of the declining species are most significant (e.g., large well-protected sites; sites that best meet the species' habitat requirements; sites with good connections to other similar habitats).</li> </ul>	<ul style="list-style-type: none"> <li>• Juniper Hairstreak habitat represented at PL by early successional red cedar woodland/thicket that is prevalent across the region in terms of representation and connectivity</li> <li>• Population estimates and trends for this species are not well known, although the species has likely declined due to development and maturation of red cedar woodlands</li> </ul>	√
Species whose range is solely or primarily found in Ontario (i.e., provincial responsibility)	<ul style="list-style-type: none"> <li>• Habitat for those species with the poorest representation within the planning area is more significant.</li> <li>• Species and their habitats are significant even if well represented in the planning area, due to high provincial responsibility for their protection.</li> <li>• Those habitats that provide the best opportunities for the long-term sustainability of the target species are most significant (e.g., large well protected sites; sites that best meet the species' habitat requirements; sites with good connections to other similar habitats).</li> </ul>	<ul style="list-style-type: none"> <li>• Juniper Hairstreak is at the northern limits of its range in Ontario.</li> <li>• 5 extant populations known (Point Pelee, eastern Ontario)</li> </ul>	√

<p>Condition of existing habitat at site</p>	<ul style="list-style-type: none"> <li>• Sites that provide habitat that best meets the survival requirements of the target species and that also include a natural buffer zone are most significant (i.e. most likely to sustain species/population over the long term).</li> <li>• Sites that contain the fewest non-native species of potential threat to the target species are significant.</li> <li>• Undisturbed or least-disturbed habitats (e.g., no/few deleterious impacts from roads, human activities) are significant.</li> <li>• Sites capable of producing a large number of individuals of a single species of conservation concern are significant.</li> <li>• Highly diverse sites that support one or more species of conservation concern are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>• Large area of contiguous red cedar woodlands and smaller areas of early successional habitat cross the Project Location and are relatively undisturbed.</li> </ul>	<p>√</p>
<p>Size of species population at site</p>	<ul style="list-style-type: none"> <li>• Habitats supporting large populations of a several species of conservation concern are most significant.</li> <li>• Habitat supporting large populations of a single species is significant.</li> </ul>	<ul style="list-style-type: none"> <li>• No observations of this species during the <i>SI</i> and no local records for this locality</li> </ul>	
<p>Size and location of habitat</p>	<ul style="list-style-type: none"> <li>• Large sites supporting large populations of several species of conservation concern are most significant.</li> <li>• Large sites are generally more significant than most comparable but smaller sites.</li> <li>• Sites large enough to ensure long-term support and viability of species of conservation concern are significant. Sites with large areas of suitable habitat that are also connected to other potentially suitable habitat and/or natural areas are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>• General foraging and breeding habitat potentially supportive of this species is found across the region</li> </ul>	<p>√</p>

<p>Potential for long-term protection of the habitat</p>	<ul style="list-style-type: none"> <li>• Habitats that provide the best opportunity for long-term protection are usually more significant than similar habitats with little opportunity for protection or facing an uncertain future due to potential threats (e.g., habitat found in a large natural area vs. an isolated site close to an expanding residential development).</li> <li>• Habitats threatened with degradation or loss are more significant than similar, but currently unthreatened habitats, if they can be protected.</li> <li>• Habitats of species currently experiencing severe population declines in Ontario (e.g., grassland bird species) due to habitat loss are most significant.</li> <li>• Habitats of species currently experiencing significant population declines in the municipality are significant.</li> </ul>	<ul style="list-style-type: none"> <li>• Habitats occur on private lands – cannot predict future scenarios for development, but local region has been in successional recovery for &gt;50 years due to farm abandonment</li> </ul>	
<p>Representation of species/habitat within the municipality</p>	<ul style="list-style-type: none"> <li>• Poorly represented habitats for species of conservation concern are significant.</li> <li>• Habitats that could be lost or severely degraded and cannot be replaced by similar habitats in the planning area are highly significant.</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat is well-represented in region</li> </ul>	
<p>Evidence of use of the habitat</p>	<ul style="list-style-type: none"> <li>• Sites with documented traditional use by species are most significant.</li> </ul>	<ul style="list-style-type: none"> <li>• No documented use by this species in the local area (Poland, 2010)</li> </ul>	
<p>Species of particular interest to the planning authority (e.g., the CAC may recommend certain species such as indicator species)</p>	<ul style="list-style-type: none"> <li>• Sites providing the best examples of habitat that will ensure the long term sustainability of the species are significant.</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive regionally and locally common early successional red cedar habitat present</li> </ul>	

**Evaluation** – Although juniper hairstreak was not found on or within 120 m of the Project Location, suitable breeding and foraging habitat was identified on and within 120 m of the Project Location. These habitats are common to the region, and the species is recognized present within Frontenac County. **Juniper hairstreak habitat is considered to be significant and will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.**

### 3.0 SUMMARY OF EVALUATION

Based on the findings in this report, the following natural features have been evaluated as significant:

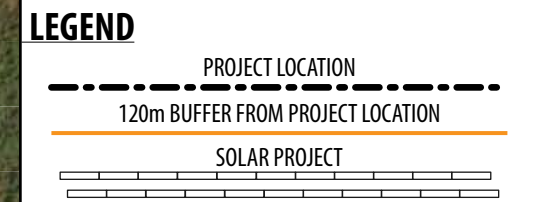
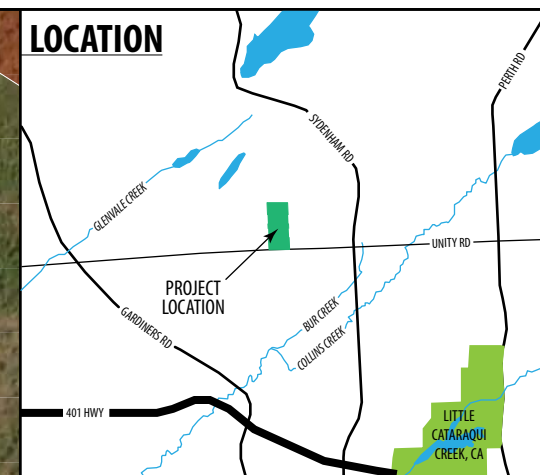
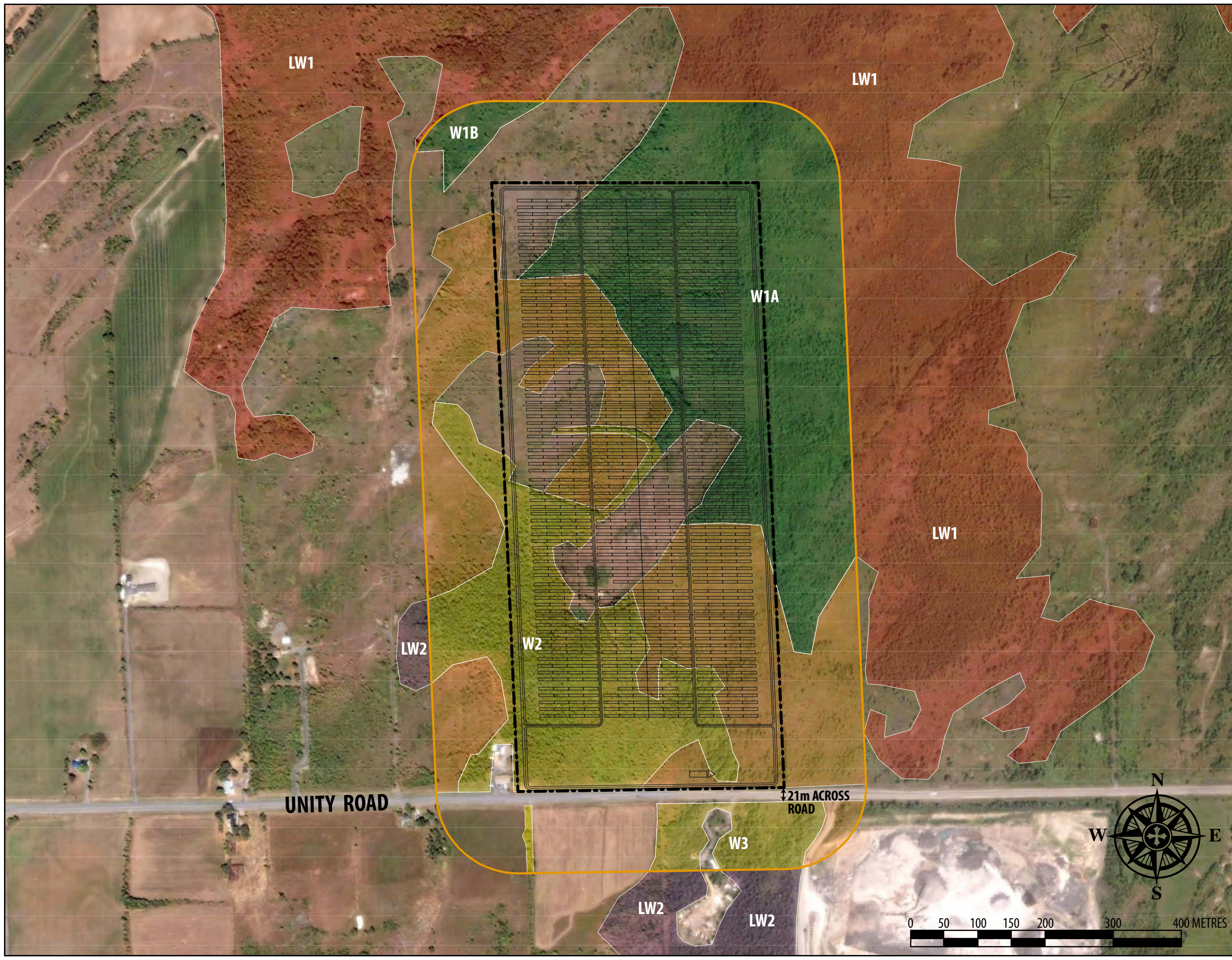
- **Significant Woodlands** – Woodland (*Woodland 1*) occurs on and within 120 m of the Project Location and has been evaluated as significant.
- **Significant Wildlife Habitat** – The following wildlife habitat types have been evaluated as significant:
  - **Habitats of species of conservation concern** – This includes *shrub/successional bird breeding habitat* and habitat potentially supportive of S1-S3-ranked species (milksnake, juniper hairstreak).

Therefore, the significant natural features identified above will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess the potential negative environmental effects on these features. A map showing the locations of these habitat types is provided on Figure 3.1. Table 3.1 is a summary of natural features identified in the *SI* and *EOS* reports for the Unity Road Project Location.

**Table 3.1. Summary of Corrections Required to NHARR (Hatch Ltd. 2011).**

SITE INVESTIGATION					EVALUATION OF SIGNIFICANCE		
Type	Functions and Attributes	Composition	Distance from Project Location (PL)	Corrections to Records Review?	Evaluation Criteria/ Procedures Used	Significant Natural Feature Confirmed?	Defining Criteria
Candidate Significant Woodland	<b>Woodland 1(a and b)</b> - Size: 18 ha of 270 ha local woodland - Proximity to significant woodlands - Linkage - Interior woodland (9 ha) - Wildlife habitat	- A: Red Cedar Cultural Woodland; White Pine-Plantation; - B: Dry-fresh White Pine-Maple-Oak Mixed Forest	10 ha within PL	No	NHRM (MNR 2010) significant woodland evaluation criteria	Yes	Criteria met: - Proximity - Interior woodland - Linkage function - Provision of significant wildlife habitat
	<b>Woodland 2</b> - Size: 11 ha - Linkage - Wildlife habitat	- Red Cedar Cultural Woodland	8 ha within PL	No	NHRM (MNR 2010) significant woodland evaluation criteria	No	Criteria not met: - Too small
	<b>Woodland 3</b> - Size: 2 ha of 17 ha woodland - Linkage - Diversity representation - Wildlife habitat	- Dry-fresh White Pine-Maple-Oak Mixed Forest	Within 120 m adjacent lands	No	NHRM (MNR 2010) significant woodland evaluation criteria	No	Criteria not met: - Too small
Seasonal Concentration Areas	<i>Raptor Wintering Area</i>	- woodland and shrub thicket communities - interior habitat - 1 possible indicator species (NOHA)	On and within 120 m of PL	No	SWHTG (MNR 2000) wildlife habitat criteria; Ecoregion Criteria Schedules (MNR 2009)	No	Criteria not met: - Common regional habitat type - No overwintering raptors (migrant only)
	<i>Amphibian breeding habitat</i>	- Small vernal woodland pool - 30-40 chorus frogs present	Within 3 m of PL access road	No	See above	No	Criteria not met: - Common regional habitat type - Low diversity of species - Seasonal, small feature (<0.1 ha)
Specialized Habitats for Wildlife	<i>Raptor nesting habitat</i>	- extensive woodlands, meadows and shrub thickets across local region	On and within 120 m of PL	No	See above	No	Criteria not met: - Common regional habitat type - Young stand age - No nesting raptors

SITE INVESTIGATION					EVALUATION OF SIGNIFICANCE		
Type	Functions and Attributes	Composition	Distance from Project Location (PL)	Corrections to Records Review?	Evaluation Criteria/ Procedures Used	Significant Natural Feature Confirmed?	Defining Criteria
Habitats of Species of Conservation Concern	<i>Shrub/early successional bird breeding habitat</i>	<ul style="list-style-type: none"> <li>- extensive local shrub thicket communities present &gt;30 ha</li> <li>- indicator species noted</li> </ul>	On and within 120 m of PL	No	SWHTG (MNR 2000) wildlife habitat criteria; Ecoregion Criteria Schedules (MNR 2009)	Yes	Criteria met: <ul style="list-style-type: none"> <li>- extensive habitat available locally</li> <li>- several indicator species present</li> </ul>
	<i>Special concern and S1-S3 species and communities (juniper hairstreak, milksnake)</i>	<ul style="list-style-type: none"> <li>- extensive red cedar woodlands, meadows and shrub thickets across local region</li> </ul>	On and within 120 m of PL	No	See above	Yes	Criteria met: <ul style="list-style-type: none"> <li>- extensive foraging habitat available</li> <li>- both species present in local region</li> </ul>



- NATURAL HERITAGE FEATURES**
- SIGNIFICANT WOODLANDS**
- WOODLAND NORTHEAST - W1A (green)
  - WOODLAND NORTHWEST - W1B (light green)
  - LOCAL WOODLAND NORTH - LW1 (red)
- SIGNIFICANT WILDLIFE HABITAT**
- SHRUB/EARLY SUCCESSIONAL BIRD BREEDING HABITAT (orange)
  - SPECIAL CONCERN AND S1-S3 SPECIES & COMMUNITIES (JUNIPER HAIRSTREAK & MILKSNAKE) (orange)
- NON-SIGNIFICANT WOODLANDS**
- WOODLAND SOUTHWEST - W2 (yellow)
  - WOODLAND SOUTHEAST - W3 (light yellow)
  - LOCAL WOODLAND SOUTH - LW2 (purple)

FIGURE 3.1

**axiopower**



Ecological Services



MINTOSH PERRY  
Consulting Engineers Ltd.

TITLE	KINGSTON GARDINER TS UNITY ROAD NATURAL HERITAGE FEATURES	
DATE	JULY 5, 2011	PROJECT No. KP-11-626
		FIGURE

#### **4.0 NEXT STEPS**

- A *Natural Heritage Assessment Environmental Impact Study Report* conducted according to the requirements of Subsection 38 (2) of O. Reg. 359/09 will be required in order to assess the potential effects, and recommend mitigation and monitoring requirements for the construction, operating and decommissioning of Project components within 120 m of these significant natural features.

## **5.0 DATE OF BEGINNING AND COMPLETION OF EVALUATION**

***Start:*** 1<sup>st</sup> Draft: September 10, 2010; 2<sup>nd</sup> Draft: May 12, 2011

***Completion:*** July 14, 2011

## 6.0 NAMES AND QUALIFICATIONS OF PERSONS CONDUCTING THE EVALUATION OF SIGNIFICANCE

The EOS assessment and report were completed by:

Dale Kristensen: Consultant, Ecological Services

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Web Site: <http://ecologicalservices.webs.com/>

Ecological Services is a locally owned firm, specializing in the provision of services relating to ecological management and research. We have been in operation in eastern Ontario since 1985. Our core personnel combine education and experience to give us a strong focus on land use planning and management as they relate to natural resources. Our experience includes environmental impact assessments, management plans, wetland evaluations, and municipal land use planning. We have research experience in aquatic ecology and chemistry, forest fragmentation, avian ecology, and fisheries ecology.

We have worked with government at the federal, provincial, local and international levels. Other clients have included Crown corporations, planning and engineering firms, developers, and local groups. Our association with Queen's University provides us immediate access to current and broad-based research, and also provides us with a pool of expert associates. A work prospectus is available at our website at <http://ecologicalservices.webs.com>.

### CURRICULUM VITAE OF DALE KRISTENSEN

#### Relevant Employment Experience

1988 - present: Environmental Consultant with Ecological Services

- Specializing in floral and faunal resource inventories, wetland evaluations, environmental impact assessments, habitat analyses, and habitat restoration.

1996 - present. Phytotron Manager (Plant Research Facility). Dept. of Biology, Queen's University.

- Manager of a controlled environment facility for plant and other research

2008 – present: Curator Queen`s University Fowler Herbarium

1987- 2009: Adjunct Academic. Department of Biology at Queen's University.

Development and instruction of various courses at Queen's University, including:

- Wildlife Issues in a Changing World (ENSC 320)
- Biology of Sex (BIOL 210)
- Field ecology module at Lake Opinicon (BIOL 344)
- Restoration Ecology (BIOL 522)
- Field Botany (BIOL 320)
- International graduate-level course on biodiversity

## **Education**

M.Sc., 1996 (Ecology) Queen's University. Kingston, Ontario.

B.Sc., 1981 (Wildlife Biology), University of Guelph. Guelph, Ontario.

## **Affiliations**

Ecological Restoration Society, North American Wildflower Society, Land Conservancy for Kingston, Frontenac, Lennox & Addington, Kingston Field Naturalists, COSEWIC Species Recovery Team – Deerberry (*Vaccinium stamineum*) and Cerulean Warbler (*Dendroica caerulea*) habitat modelling for St. Lawrence Islands National Park. Provincially Certified Butternut Health Assessor

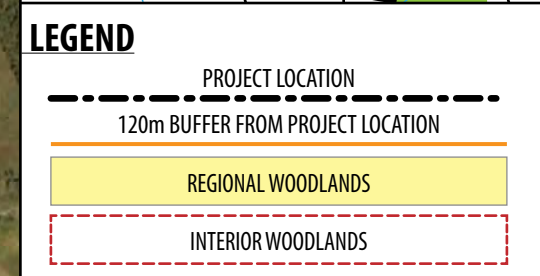
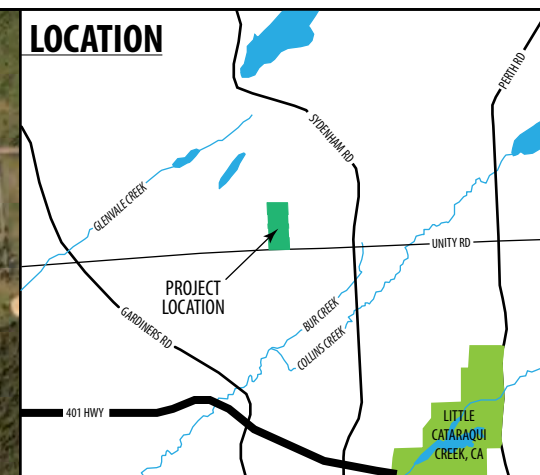
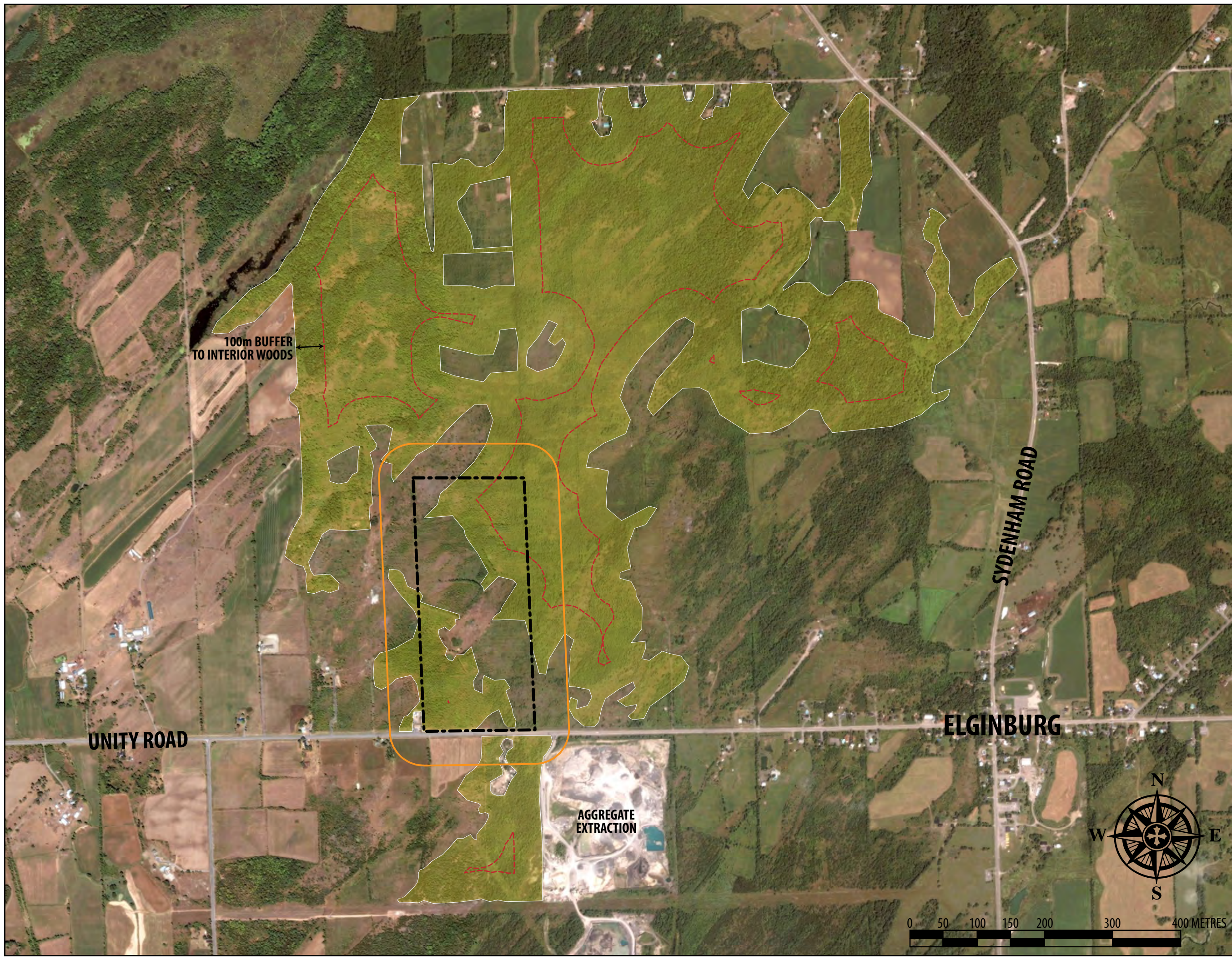
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## **Appendix A. Local forest cover in relation to Project Location**



WOODLANDS NORTH OF UNITY ROAD	
REGIONAL WOODLAND	= 269.4ha
INTERIOR WOODLAND	= 89.6ha
WOODLAND SOUTH OF UNITY ROAD	
REGIONAL WOODLAND	= 16.8ha
INTERIOR WOODLAND	= 0.8 ha

**axiopower**



TITLE	KINGSTON GARDINER TS UNITY ROAD PROJECT LOCATION & REGIONAL WOODLAND	
DATE	JUNE 29, 2011	PROJECT No. KP-11-626
FIGURE		