# Natural Heritage Constraints Study– 394 Lily Lake Road, Township of Selwyn, County of Peterborough, Ontario

September 26, 2023

Prepared for:
Peterborough Utilities Inc.

Cambium Reference: 18512-001

CAMBIUM INC.

866.217.7900

cambium-inc.com

# Table of Contents

## List of Inserted Tables



## List of Appended Figures

# List of Appendices

# 1.0 Introduction

Cambium Inc. (Cambium) was retained by Peterborough Utilities Inc. (the Client) to conduct a Natural Heritage Constraints study at the Lily Lake Solar Farm, located on Lily Lake Road, in the Township of Selwyn, Peterborough County, Ontario. We understand that the Client is submitting a proposal as part of the Independent Electricity System Operator (IESO) Long-Term 1 Procurement Program, to develop a battery energy storage solution (BESS) within the existing Lily Lake Solar Farm property. If awarded, the project will require a Class EA for Minor Transmission Facilities; a development permit from the local Conservation Authority may also be required. The southeastern portion of the property that encompasses the potential new infrastructure areas will be considered the Site for this report (Figure 1).

The Site fronts on Lily Lake Road to the south and Fife's Bay Road to the east. The Site is within Ecoregion 6E of Ontario (Crins, Gray, Uhlig, & Wester, 2009), and is located west of the City of Peterborough, outside of the settlement area boundary. The Site is currently developed as a solar farm and is actively pastured (sheep), with a barn and several storage structures present in the central portion of the Site. Adjacent land uses are primarily agricultural and rural; the Jackson Creek Provincially Significant Wetland (PSW) is mapped along the northern Site boundary.

The following Natural Heritage Constraints Study (NHCS; the Study) serves as a preliminary environmental screening to characterize the natural heritage and hydrologic features on and adjacent to the Site. Natural elements of the Site were characterized based on natural heritage and hydrologic feature definitions and criteria established in the Provincial Policy Statement, 2020 (PPS), to ensure that locally relevant feature types were appropriately considered; however, energy infrastructure projects are not necessarily required to conform with the policies of the PPS. This Study includes the results of the background review, a description of methods used to collect site-specific natural heritage information, and a summary the findings. In addition, the Study includes recommendations for site layout, best management practices, and further studies.

# 2.0 Natural Heritage Policy Context

The development of Site Plans for the proposed undertaking should take into consideration the following legislation, plans, and policies:

- Conservation Authority Regulation and Planning and Policy Regulations Manual; O.Reg. 167/-06 – Otonabee Region Conservation Authority
- Peterborough County Official Plan, Selwyn Land Use Schedule, and Zoning By-law No. 2009-021
- Endangered Species Act, 2007 (ESA)
- Fisheries Act
- Species at Risk Act (SARA)
- Migratory Birds Convention Act, 1994 (MBCA)

## 2.1 Conservation Authority Regulation

“Conservation Authorities are community-based watershed management agencies, whose mandate is to undertake watershed-based programs to protect people and property from flooding, and other natural hazards, and to conserve natural resources for economic, social and environmental benefits” (Conservation Ontario, 2022). Conservation Authorities each have their own Ontario Regulation under the *Conservation Authorities Act, 1990*.

ORCA regulates hazard lands under Ontario Regulation167/06: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

## 2.2 Official Plan and Zoning By-Law

The municipal land use designations and zoning of the Site are summarized in Table 1:

**Table 1 Summary of Municipal Official Plan and Zoning By-law Designations**

| Source | Designation / Zoning |
|---|---|
| Peterborough County Official Plan | Rural, Provincially Significant Wetland |
| Township of Selwyn Land Use Schedule | Agriculture, Natural Core Area, Floodplain Overlay |
| Township of Selwyn Zoning By-law – 2009-021 | RU, RU 472, EP |

The new Peterborough County Official Plan has been amended and adopted by Council but has not yet received approval from the Minister of Municipal Affairs and Housing.

The new Official Plan includes the Jackson Creek PSW as part of the Refined Natural Heritage System.

## 2.3 Endangered Species Act, 2007

Species listed as endangered or threatened on the Species at Risk in Ontario (SARO) list, and their habitats, are protected under the provincial Endangered Species Act, 2007 (ESA) (Government of Ontario, 2007). Section 9(1) of the ESA prohibits a person from killing, harming, harassing, capturing or taking a member of a species listed as endangered, threatened, or extirpated. Section 10(1) of the ESA prohibits the damage or destruction of habitat of species listed as endangered or threatened. Protection of special concern species is provided through designation of their habitat as significant wildlife habitat (SWH), a provincially protected natural heritage feature. Species at risk (SAR) are discussed throughout this report, as applicable.

MECP is responsible for administering the ESA and providing direction on potential compliance issues. MECP has prepared a guidance document titled *Client's Guide to Preliminary Screening for Species at Risk* (Ministry of the Environment, Conservation and Parks, 2019). This document aims to "help clients better understand their obligation to gather information and complete a preliminary screening for SAR before contacting the Ministry". This document was used to guide the SAR habitat-based screening for the Study.

## 2.4 Fisheries Act

Fisheries and Oceans Canada (DFO) administers the federal Fisheries Act which defines fish habitat as "*spawning grounds and other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes*" (Subsection 2(1)). Works within and adjacent to lakes, watercourses, and other bodies of water containing fish have the potential to impact fish and/or fish habitat. The Fisheries Act prohibits the harmful alteration, disruption, or destruction (HADD) of fish habitat (Subsection 35(1)), which is defined as "*any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes*".

As a result of amendments to the federal Fisheries Act in 2019, projects near water that could potentially impact fish or fish habitat may require DFO review. The primary purpose of the review is to determine whether HADD of fish habitat, as defined by the Act, can be avoided. The DFO Fisheries Protection Program provides a Decision Framework and guidance material applicable to these reviews (available on-line at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html).

## 2.5 Species at Risk Act

The federal Species at Risk Act (SARA) was adopted in 2002 to prevent endangered or threatened species from becoming extinct or extirpated, to help in the recovery of endangered, threatened, and extirpated species, and to manage species of special concern to help prevent them from becoming endangered or threatened. Habitat which is deemed necessary for the survival/recovery of a listed wildlife species, referred to as Critical Habitat, is protected under Section 56 of the SARA. The SARA applies to all federal lands in Canada; however, at-risk aquatic and migratory bird species located on private property in Ontario also receive protection under the Act.

## 2.6 Migratory Birds Convention Act, 1994

The federal Migratory Birds Convention Act, 1994 (MBCA) prohibits killing, capturing, injuring, taking, or disturbing of the listed migratory birds. Including damaging, destroying, removing, or disturbing of nests of all migratory bird species that contain a live birds or viable eggs. In 2022,

new *Migratory Birds Regulations* (MBR) were adopted that offer year-round protection for the nests of 18 migratory species, until the nest is deemed to be abandoned. Nest abandonment must be reported through the Abandoned Nest Registry, administered by Environment and Climate Change Canada (ECCC), if there is a need to damage, disturb, destroy, or remove a nest of a species listed in Schedule 1 of the MBR. The time period to confirm nest abandonment varies by species, and ranges from 12 - 36 months.

To ensure compliance with the MBCA during development, best management practices should be implemented to detect and avoid disturbances to active nests of listed species. Active nests are protected and should be left undisturbed until all young have fledged, the nest is determined by a professional to be inactive or abandoned.

# 3.0 Technical Approach and Data Collection Methods

## 3.1 Background Information Review

Supporting background information pertaining to the Site and surrounding landscape was compiled and reviewed, as part of a comprehensive desktop exercise, to better understand local biophysical conditions. Data was obtained from provincial, municipal, and other online resources to provide context to the development proposal, and to guide development of the Site-specific work program. Field studies were subsequently conducted to verify and/or add detail to the high-level contextual information derived from these publicly available resources.

The comprehensive desktop review for this Site included the following resources:

- Land Information Ontario (LIO) database via the online Natural Heritage Areas: Make-a-Map tool (Ministry of Natural Resources and Forestry, 2023)
- Natural Heritage Information Center (NHIC) database: species at risk (SAR) occurrence records
- Online Atlas Data:
  - Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2018)
  - Ontario Breeding Birds Atlas (OBBA) (2001-2005) (Bird Studies Canada, 2005)
- Aquatic Species at Risk distribution maps (Fisheries and Oceans Canada, 2022)
- Aquatic Resource Area Summary Data (Government of Ontario, 2023)
- Fish ON-Line (Ministry of Natural Resources and Forestry, 2022)
- Peterborough District Wetland Report: Jackson Creek Wetland (Ontario Ministry of Natural Resources, 2019)

Mapped natural heritage features present in the general area of the Site are shown on Figure 1. A summary of background review results is provided in Table 2.

**Table 2 Background Review Summary**

| Source | Location Reference | Relevant Records |
|---|---|---|
| LIO Geographic Database | Site and 120 m adjacent lands | Jackson Creek Provincially Significant Wetland<br>Unnamed Watercourse<br>Colonial Waterbird Nesting Area |
| NHIC Database | Grid Squares<br>17QK0709<br>17QK0809<br>17QK0710<br>17QK0810 | Blue-winged Teal – S3B, S4M<br>Bobolink – THR<br>Common Gallinule – S3B<br>Eastern Meadowlark – THR<br>Eastern Wood-pewee – SC<br>Grasshopper Sparrow – SC<br>Least Bittern - THR<br>Wood Thrush – SC<br>Midland Painted Turtle – SC (federally)<br>Snapping Turtle - SC<br>Western Chorus Frog – SC (federally)<br>Black Ash – END |
| Ontario Breeding Bird Atlas (OBBA) | Grid Square<br>17QK00<br>17TQK01 | Incorporated into list of species within Appendix A |
| Ontario Reptile and Amphibian Atlas (ORAA) | Grid Square<br>17QK00<br>17QK01 | Incorporated into list of species within Appendix A |
| Aquatic SAR distribution maps | Site and 120 m adjacent lands | None |

*Note: THR = Threatened species on SARO list; END = Endangered species on SARO list; SC = Special concern species on SARO list. The species of conservation concern screening provided in Appendix A includes a list of all species within the overlapping OBBA and ORAA squares with potential policy implications.*

## 3.2 Consultation and Agency Correspondence

No direct consultation with Fisheries and Oceans Canada (DFO), the Ministry of Natural Resources and Forestry (MNRF), the Ministry of Environment, Conservation, and Parks

(MECP), or the local Conservation Authority (ORCA) was undertaken due to the preliminary screening nature of this Study.

## 3.3 Field Investigations

Ecological investigations were completed on the Site to better understand the natural character of the Site and confirm the natural heritage and hydrologic features present. Information gathered through the background review was used to guide the development of the fieldwork program and was supplemented with additional site-specific information gathered through various standard methodologies. Survey methodologies for each of the field investigations completed on the Site are described in the following sections.

All surveys were conducted by appropriately trained Cambium staff. Survey stations and select feature boundaries were GPS marked in the field. Data were documented manually, reviewed upon return to the office, and transposed to digital format for secure data management.

### 3.3.1 Ecological Land Classification

The Ecological Land Classification (ELC) System for Southern Ontario (Lee, et al., 1998) was used to classify vegetation communities on the Site. Definitions of vegetation types are derived from the ELC for Southern Ontario First Approximation Field Guide (Lee, et al., 1998) and the revised 2008 tables. ELC units were initially delineated and classified by orthoimagery interpretation. Field investigations served to confirm the type and extent of ELC communities on the Site through vegetation inventory, and soil assessment with a hand auger where vegetation types could not be classified based on vegetation alone. Where vegetation communities extended off the Site, classification was done through observation from property boundaries and publicly accessible lands.

### 3.3.2 Wetland Boundary Delineation

In Ontario, wetlands are mapped and evaluated under the Ontario Wetland Evaluation System (OWES). Mapped evaluated wetlands have undergone extensive study and been assessed based on their form and function under four categories: Biological, Social, Hydrological, and

Special Features (Ministry of Natural Resources, 2022). Evaluated wetlands that score high enough are deemed Provincially Significant Wetlands (PSW). Evaluated wetlands that did not score high enough to be a PSW are called Locally Significant Wetlands (LSW). The province also maps unevaluated wetlands. These mapped wetlands are approximate; as such, they require field verification to confirm their presence and determine their boundaries.

The subject wetland was delineated following provincially approved methods outlined in the Ontario Wetland Evaluation System: Southern Manual, 3rd Ed. (Ministry of Natural Resources, 2022). Fieldwork was carried out by provincially certified Cambium staff. Wetland boundaries were initially delineated and classified by orthoimagery interpretation. The presence/absence of wetlands on the Site was confirmed through field investigations during the growing season (late May through October). Wetland boundaries were determined using the 50% wetland vegetation rule. Where vegetation-based delineation was inconclusive, soil assessment with a hand auger was used to confirm wetland boundaries. Wetland boundaries on the Site were marked with a hand-held GPS unit. Where wetland communities extend off the Site, classification was done through observation from property boundaries and publicly accessible lands.

### 3.3.3 Surface Water and Drainage Feature Mapping

Surface water features confirmed on and adjacent to the Site were assessed based on their flow regime and direction, channel form, and habitat characteristics, through visual investigation. All watercourse and drainage feature crossings were documented, and GPS marked in the field.

### 3.3.4 Habitat-Based Wildlife Surveys

Given the scale of the proposed development, a habitat-based approach was used to assess potential impacts to wildlife, consistent with standard practice. General habitat information gathered through the field investigations was used to assess the connectivity of the Site with the surrounding landscape and evaluate the ecological significance of the local area. Any evidence of breeding, forage, shelter, or nesting was noted.

# 4.0 Characterization of Natural Features and Functions

Data acquired through the background information review and field investigations is summarized in the following sections. Based on the information gathered, an assessment of significance has been completed to identify sensitive natural heritage and hydrologic features on and/or adjacent to the Site.

A summary of the field investigations completed on the Site is presented in Table 3. Representative Site photos are included within the Photo Log, in Appendix B. Survey areas are shown on Figure 2.

**Table 3 Summary of Field Investigations**

| Date | Time On Site | Weather | Observer | Activities |
|---|---|---|---|---|
| 2023-08-24 | 10:15 – 13:15 | 20°C<br>Wind: 1<br>Noise: 0 | T. Jamieson<br>D. Fleming | Ecological Land Classification<br>Wetland Boundary Delineation<br>Surface Water and Drainage Feature Mapping<br>Habitat-based Wildlife Surveys |
| 2023-09-01 | 10:30 – 12:00 | 17°C<br>Wind: 1<br>Noise: 0 | K. Domsic | Ecological Land Classification<br>Wetland Boundary Delineation<br>Surface Water and Drainage Feature Mapping<br>Habitat-based Wildlife Surveys |

*Notes: Wind = Beaufort Wind Scale value (0 = 0-2 kph, 1 = 3-5 kph, 2 = 6-11 kph, 3= 12-19 kph, 4 = 20-30 kph, 5 = 31-39 kph, 6 = 40-50 kph). Noise is reported based on background noise levels: Index 0 – no appreciable effect, 1 – slightly affecting sampling, 2 – moderately affecting sampling, 3 – seriously affecting sampling, 4 – profoundly affecting sampling.*

## 4.1 Landscape Position and Topography

The Site is located within the Mixedwood Plains Ecozone: Lake Simcoe Rideau Ecoregion 6E, which extends southward from a line connecting Lake Huron in the west to the Ottawa River in the east, including Ottawa, Kingston, Peterborough, Barrie, Tobermory, Kitchener, and Toronto. This Ecoregion is characterized by a mixed geology that includes both shallow soil areas such as alvar and bedrock plains, as well as deep soil areas such as the Oak Ridges Moraine. It falls within the Great-Lakes St. Lawrence Forest Region, including deciduous and

mixed forests; however, over 50% of the landscape in this Ecoregion is currently in use as agricultural land (Lee, et al., 1998).

The Site is located on hilly topography, in an area characterized by till plains with scattered drumlins. Vertical elevations on the Site range from 245 metres above sea level (masl) to 270 masl. Topographic high points are located near the southeast area (i.e., near intersection of Lily Lake Road and Fife's Bay Road) and west-central area (i.e., near the existing barn) of the Site. Lower elevation terrain corresponds with the PSW along the west and north Site boundaries, and with the mapped watercourse in the south-central area of the Site; portions of the Site drain towards each of these low points.

### 4.1.1 Historical Land Use

A review of historical aerial imagery for the Site area indicates that land use on the Site was agricultural from approximately 1928 to 2009. Construction of the current solar farm appears to have commenced in 2010 or 2011. The mapped PSW has remained relatively unchanged, excluding an area fronting on Fife's Bay Road that was cleared of trees in approximately 1950; this area has since re-naturalized with tree and other vegetative growth.

## 4.2 Surface Water and Drainage Features

The general direction of overland flow on the Site is from northeast to southwest. A watercourse is mapped in the south-central portion of the Site, flowing in a southerly direction; a corridor along this feature is zoned EP in the Township's Zoning By-law. The field investigations confirmed this feature to be associated with low topography between hills on the Site. Two associated headwater wetland features were observed near the northern extent of the feature, with a culvert that could convey occasional flows southward under the existing gravel laneway. No defined channel was observed along the extent of the mapped feature during the field investigations. Surface water was limited to the two northern headwater wetlands. South (i.e., downstream) of the wetlands, the feature consisted of a vegetated swale with no defined channel or substrate sorting; it is assumed to exhibit an ephemeral flow regime (i.e., transporting snow melt and occasional storm flows), with the majority of precipitation

infiltrating on-site. Immediately south of the Site, a single 45 cm diameter corrugated steel pipe (CSP) culvert was observed at the crossing under Lily Lake Road. The culvert was found to be in relatively poor condition (i.e., vertically compressed, corroded bottom). A short outflow channel was observed south of Lily Lake Road; surrounded by terrestrial meadow vegetation. A shallow marsh community was observed farther south, with no visible flow connection to the mapped watercourse to the north, consistent with a gap in the mapped watercourse which reappears as a channelized ditch through the Dobbin Transformer Station south of Lily Lake Road. Overland flow from the Site that is directed to this feature may ultimately reach Jackson Creek farther to the south. No fish habitat is present in the mapped watercourse on the Site.

A second mapped watercourse is located within the Jackson Creek PSW along the northern Site boundary, generally flowing in a southwesterly direction. This feature was confirmed to be present within the PSW during the field investigations. Triple CSP culverts allow flow under Fife's Bay Road north (i.e., upstream) of the Site. Flows are conveyed southward under a bridge on Lily Lake Road, approximately 500 m west of the Site. Due to the position of the watercourse within the PSW, aquatic habitat surveys were not undertaken. Based on publicly available mapping, this feature connects to Jackson Creek approximately 740 m south of Lily Lake Road. This feature is assumed to provide habitat for fish.

## 4.3 Wetland Delineation

The Jackson Creek PSW is located along the northern Site boundary and extends across the local landscape to the northeast and southwest of the Site. This PSW encompasses a total area of approximately 757 ha and is composed of two wetland types: marsh (95%) and swamp (5%) (Ontario Ministry of Natural Resources, 2019).

The actual wetland boundary of the PSW was confirmed during the field investigations to be generally associated with the treed edge, along the northern Site boundary. It was found to be generally consistent with provincial mapping. The boundary was determined based on 50% relative cover by wetland vegetation species, according to the OWES southern manual, and was further supported by observations of topographical changes and surface water. Off-site portions of the PSW were investigated from Fife's Bay Road north of the Site and from Lily

Lake Road west of the Site; overall, the PSW appears to be present as mapped. The PSW boundary on Site was GPS marked in the field, as shown on Figure 2.

## 4.4 Vegetation Communities

The vegetation communities on the Site are summarized in Table 4 and are mapped on Figure 2. Representative photos for each community are provided in Appendix B.

**Table 4 Vegetation Communities**

| No. | ELC Code | Community Description | Community Type | S - Rank |
|---|---|---|---|---|
| 1 | OAGM4 /CVI_4 | Open Pasture / Power Generation | Terrestrial | SNA |
| 2 | CUM1-1 | Mineral Cultural Meadow | Terrestrial | S5 |
| 3 | CUM1 | Dry – Moist Old Field Meadow | Terrestrial | S5 |
| 4 | CUP3-8 | White Spruce – European Larch Coniferous Plantation | Terrestrial | SNA |
| 5 | FOC4-1 | Fresh – Moist White Cedar Coniferous Forest | Terrestrial | S5 |
| 6 | SWT2-2 | Willow Mineral Thicket Swamp | Wetland | S5 |
| 7 | MAS2-1 | Cattail Mineral Shallow Marsh | Wetland | S5 |
| 8 | MAM | Meadow Marsh | Wetland | SNA |

No provincially rare vegetation communities were observed on the Site or adjacent lands. Similarly, no at-risk or provincially rare (S1, S2) species were observed during the field investigations. Overall, the vegetation identified on the Site was composed of species that are common and widespread throughout south-central Ontario.

### 4.4.1 Soil Characterization

Soil characterization was completed for wetland and transitional vegetation communities to gain an understanding of the presence of organic soils on the Site. Soils were sampled using a

hand auger. A summary of the soil characterization work completed on the Site is provided in Table 5, and soil assessment station locations are shown on Figure 2.

**Table 5 Soil Characterization Summary**

| No. | ELC Code | Soil Description |
|---|---|---|
| 1 | CUM1-1 | Organics layer <2 cm overlying mineral profile. |
| 2 | CUP3-8 | Organics layer <2 cm overlying mineral profile. |
| 3 | MAS2-1 (PSW) | Organic layer of approximately 10 cm overlying mineral profile with mottles at surface; standing water present. |
| 4 | FOC4-1 | Mineral profile; upper horizon enriched with organic matter but no distinct organic layer present. |
| 5 | CUM1-1 | Mineral profile with no organic build up. |
| 6 | FOC4-1 | Mineral profile; upper horizon (approx. 18 cm) enriched with organic matter but no distinct organic layer present. Cedar duff abundant on surface. |
| 7 | MAS2-1 (PSW) | Organic layer of approximately 10 cm overlying mineral profile with mottles and gley at surface. |
| 8 | SWT2-2 | Mineral profile with no organic build up; abundant coarse fragments. |

## 4.5 Significant Woodlands

In the past 200 years, over 70 percent of woodland cover has been lost in Ecoregions 6E and 7E (Ministry of Natural Resources, 2010). The protection of woodland cover in southern Ontario is an important concern (Ministry of Natural Resources, 2010). Significant woodlands are natural heritage features that are afforded protection under provincial policy within Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River), which occur to the south and east of the Canadian Shield. Currently, according to their respective Official Plan Schedules, the planning authority has not explicitly defined or designated significant woodlands within their jurisdiction. In the absence of local criteria for evaluating woodlands, the Natural Heritage Reference Manual (NHRM) provides such guidance (Ministry of Natural Resources, 2010).

A summary of the significant woodlands assessment, based on the criteria and standards listed in Table 7-2 of the NHRM, is provided in Table 6. To be considered significant, a woodland must meet the minimum standard for any one of the criteria listed in Table 6 *and* meet the minimum size for that woodland criterion. The minimum size criteria are contingent upon the percent cover of woodlands within the jurisdiction. Approximately 39% of Peterborough County is comprised of woodland cover (personal communication, ORCA staff, 2020); the column in Table 6 that relates to this percentage has been bolded for ease of reference to the appropriate criteria. An explanation of the results is presented in the following sections.

**Table 6 Summary of Woodland Significance Evaluation**

| Woodlands Significance Criteria | Percent Cover of Woodland in Planning Area | | | | | Meets Criteria (Yes/No) |
|---|---|---|---|---|---|---|
| | <5% | 5-15% | 16-30% | 31-60% | >60% | |
| **Woodland Size Criterion** | | | | | | |
| Woodland Size | 2 ha | 4 ha | 20 ha | **50 ha** | N/A | No |
| **Ecological Functions Criteria** | | | | | | |
| Woodland Interior | any | any | 2 ha | **8 ha** | 20 ha | No |
| Proximity to Other Woodlands and Other Habitats | 0.5 ha | 1 ha | 4 ha | **10 ha** | 20 ha | No |
| Linkages | 0.5 ha | 1 ha | 4 ha | **10 ha** | 20 ha | No |
| Water Protection | 0.5 ha | 0.5 ha | 2 ha | **4 ha** | 10 ha | No |
| Woodland Diversity (composition) | 0.5 ha | 1 ha | 4 ha | **10 ha** | 20 ha | No |
| **Uncommon Characteristics Criteria** | | | | | | |
| Unique Species Composition | 0.5 ha | 1 ha | 2 ha | **4 ha** | 10 ha | No |
| Rare Vegetation Community | 0.5 ha | 1 ha | 2 ha | **4 ha** | 10 ha | No |
| Rare or Uncommon Plant Species | 0.5 ha | 1 ha | 2 ha | **4 ha** | 10 ha | No |
| Older Woodland Characteristics | 0.5 ha | 1 ha | 2 ha | **4 ha** | 10 ha | No |
| **Economic and Social Functions Criteria** | | | | | | |
| High Economic or Social Value | N/A | N/A | N/A | **N/A** | N/A | No |

*Note: woodlands must meet characteristics listed in the criterion **and** the corresponding area threshold Bold values indicate the area threshold relevant to this Site.*

The woodlands on the Site encompass an area of approximately 2.3 ha and provide no interior habitat. The woodlands on the Site do not meet the minimum size for any of the criteria listed above. As such, the woodlands on the Site are not considered to be significant based on the NHRM criteria.

Woodlands on adjacent lands east of Fife's Bay Road and north of the PSW may meet the NHRM criteria for significance; however, since these features are separated from the Site by the existing road and the PSW, they are not discussed further in this report.

## 4.6 Wildlife Habitat Survey Results

The Jackson Creek PSW is known to provide habitat for a range of wildlife species including Great Blue Heron (*Ardea herodias*), Green Heron (*Butorides virescens*), and Marsh Wren (*Cistothorus palustris*), American Bullfrog (*Lithobates catesbeianus*), Midland Painted Turtle (*Chrysemys picta marginata*), American Mink (*Neovison vison*), Muskrat (*Ondatra zibethicus*), Northern Raccoon (*Procyon lotor*), and Weasel (*Mustela sp*.) (Ontario Ministry of Natural Resources, 2019).

The majority of the Site is comprised of open pasture amongst solar panels (Community 1) and some additional cultural meadow / old field areas exist along the northern edge of the pasture, outside of the electric fence (Communities 2 and 3, respectively). These communities are suitable to support grassland bird species; Eastern Meadowlark (*Sturnella magna;* provincially threatened) was observed in the cultural meadow (Community 2) on the Site. At-risk grassland bird species are discussed in more detail in in Section 4.9.

The wetlands on the Site and adjacent lands to the south (i.e., associated with the ephemeral watercourse) provide suitable breeding habitat for some amphibian species. Northern Leopard Frog (*Lithobates pipiens*) was observed incidentally around the edge of the wetlands on the Site (i.e., Community 7) during the field investigations. There is potential for additional frog and toad species to also use these wetlands. These wetlands are not sufficient in size or depth to support turtle overwintering; turtle species are unlikely to be present throughout the majority of the Site.

Treed areas on the Site are limited to the southern edge of the PSW. These areas are primarily comprised of coniferous tree species such as Eastern White Cedar (*Thuja occidentalis*), European Larch (*Larix decidua*), and White Spruce (*Picea glauca*) (refer to

Communities 3 and 4). Deciduous forests are present on adjacent lands. No cavity trees were documented on the Site during the field investigations conducted to date.

## 4.7 Significant Wildlife Habitat

Guidance documents produced by the MNRF for the identification and evaluation of SWH were used to identify and confirm occurrences of SWH on the Site (MNR, 2000). The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (Ministry of Natural Resources and Forestry, 2015) apply to the subject property. Information gathered during the background review and field investigations were compared to SWH criteria to evaluate the property for SWH, as detailed in Appendix C. The results of the SWH assessment are provided in the following sections. Details on species of conservation concern and their protected habitats are provided in Section 4.9.

### 4.7.1 Jackson Creek PSW

The Jackson Creek PSW is known to provide Colonial Waterbird Nesting (Great Blue Heron and Green Heron), as well as Waterfowl Staging (regional significance), Waterfowl production (local significance), and Migratory Shorebird Stopover habitat (high significance) (Ontario Ministry of Natural Resources, 2019).

The PSW also has potential to provide Turtle Wintering SWH, Amphibian Breeding SWH (wetland), and Marsh Bird Breeding SWH.

Transitional slopes along the PSW edge have potential to provide Reptile (snake) Hibernaculum SWH, Bald Eagle and Osprey Nesting, Foraging, and Perching SWH, Seeps and Springs SWH, and Terrestrial Crayfish SWH.

### 4.7.2 Open Habitats on the Site

Open areas of the Site have potential to provide Turtle Nesting SWH and Open Country Bird Breeding SWH.

## 4.8 Fish and Fish Habitat

Jackson Creek, the downstream receiver of the watercourses on and adjacent to the Site, is known to support a fish community which includes Bluegill (*Lepomis macrochirus*), Rock Bass (*Ambloplites rupestris*), Smallmouth Bass (*Micropterus dolomieu*), and White Perch (*Morone americana*). Based on this information, the creek provides thermal habitat conditions ranging from warmwater to coolwater.

## 4.9 Species of Conservation Concern

According to the Significant Wildlife Habitat Technical Guide (Ministry of Natural Resources, 2000), Species of Conservation Concern (SCC) include species that are identified as at risk by COSEWIC or on the SARO list, known rare species (provincially, regionally, locally), and species with populations in known decline. A list of SCC, including SAR, with potential to occur in the general vicinity of the Site has been compiled based on known species' ranges, habitat requirements, and review of background information sources (as listed in Section 3.1). In addition, the list has been augmented with direct field observations from the Study, as detailed in the previous sections. As noted above, Cambium has employed a habitat-based screening in order to identify suitable habitat for species located on or adjacent to the Site. A detailed habitat suitability analysis is provided in Appendix A and a discussion of the results is provided below.

No Critical Habitat for aquatic species at risk listed under SARA was identified in the watercourses on and adjacent to the Site.

### 4.9.1 Endangered and Threatened Species

The habitat of provincially listed endangered and threatened species is regulated under the ESA. The following endangered and threatened species are known to occur in the regional area of the Site, and the habitat types occurring on the Site may support these species.

Bobolink (*Dolichonyx oryzivorus*) is listed federally and provincially as threatened. Bobolink utilizes tall, grassy meadows, hayfields, and croplands for foraging and tend to nest in forage

crops (hayfields and pastures). Open areas of the Site provide suitable habitat (Communities 1, 2, and 3). No Bobolinks were observed during the field investigations.

Eastern Meadowlarks are listed federally and provincially as threatened. They build their nests on the ground, camouflaged and woven with long grasses, as found in pasture and hayfield, orchard, shrubby field, and other open area habitats. Open areas of the Site provide suitable habitat (Communities 1, 2, and 3). One Eastern Meadowlark was observed incidentally at the north end of Community 2 during field investigations.

Least Bittern (*Ixobrychus exilis*) is a small member of the heron family and has brown and beige plumage with chestnut patches on its wings. The species nests in marshes (> 5 - 10 ha) and swamps dominated by emergent vegetation, preferably cattails, interspersed with patches of woody vegetation and open water. The Jackson Creek PSW provides suitable habitat. No Least Bitterns were observed during the field investigations.

Blanding's Turtle (*Emydoidea blandingii*) is listed as threatened both federally and provincially. They spend most of their life cycle in large wetlands or shallow lakes with high densities of water plants, nutrient rich water, and organic sediment. The Jackson Creek PSW provides suitable habitat. No Blanding's Turtles were observed during the field investigations.

Spotted Turtle (*Clemmys guttata*) is semi-aquatic and prefers ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation. This species usually hibernates in wetlands or seasonally wet areas with structures such as overhanging banks, hummocks, tree roots, or aquatic animal burrows. The Jackson Creek PSW provides suitable habitat. No Spotted Turtles were observed during the field investigations.

Treed portions of the Site may provide habitat for the following bat species: Tri-coloured Bat (*Perimyotis subflavus*), Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), and Northern Myotis (*Myotis septentrionalis*). No suitable cavity trees suitable for bat roosting were noted. Open areas of the Site may be used as foraging habitat for these species; however, foraging habitat is not protected under the ESA. As such, it is unlikely that

the Site qualified as protected habitat for SAR bats. No SAR bats or evidence of bats was observed on the Site.

Black Ash (Fraxinus nigra) was added to the Species at Risk in Ontario List (O. Reg. 230/08) as an Endangered species on January 26, 2022. This species prefers moist climates and soils such as in swampy woodlands and bogs. Suitable habitat is present in the PSW and smaller wetlands on the Site. A Minister's Order temporarily paused the protections (species and habitat) for Black Ash under the ESA for a period of two years (i.e., until January 26, 2024). As this species does not currently receive species or habitat protection under the ESA it will not be further discussed in this report.

Butternut (*Juglans cinerea*) is listed as federally and provincially endangered. Butternut trees naturally grow in a variety of treed and open habitats in Ontario. They occur along fencerows, within treed riparian zones, on the lower slopes of treed ravines, and in and around mixed deciduous woodlots and forests, where they grow beneath canopy openings, near forest edges and along forest roads. Trees occur on rich, moist, well-drained loams and on well-drained rocky soils, especially of limestone origin. Cultivated Butternut trees may be present in additional habitats such as manicured gardens and parks. No butternuts were observed during the field investigations.

### 4.9.2 Special Concern Species

Black Tern (*Chlidonias niger*) builds floating nests in loose colonies in shallow marshes, with a preference for cattails. They breed primarily in the marshes along the edges of the Great Lakes, but may also use wetlands further north, if suitable. The Jackson Creek PSW provides suitable habitat. No Black Terns were observed during the field investigations.

The Eastern Wood-pewee (Contopus virens) lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. Potential habitat is present in forests adjacent to the Site. No Eastern Wood-pewees were observed during the field investigations.

The Grasshopper Sparrow (*Ammodramus savannarum*) inhabits open grasslands and prairies, or pastures and hayfields, with well-drained soil that are sparsely vegetated. Open areas of the

Site provide suitable habitat (Communities 1, 2, and 3). No Grasshopper Sparrows were observed during the field investigations.

Short-eared Owl (*Asio flammeus*) is found in scattered pockets across the province where suitable open habitat, including grasslands, tundra, peat bogs and marsh, can be found in sufficient quantities. Adults build nests on the ground in grassy areas and occasionally agricultural fields. Open areas of the Site provide suitable habitat (Communities 1, 2, and 3). No Short-eared Owls were observed during the field investigations.

Eastern Musk Turtle (*Sternotherus odoratus*) is a small freshwater turtle found primarily in slow moving water bodies with abundant emergent vegetation and mucky bottoms along the southern edge of the Canadian Shield. The Jackson Creek PSW provides suitable habitat. No Eastern Musk Turtles were observed during the field investigations.

The Snapping Turtle is found in shallow water with soft mud and leaf litter, but travel to gravel or sandy embankments/beaches to lay eggs. The Jackson Creek PSW provides suitable habitat. No Snapping Turtles were observed during the field investigations.

The Eastern Ribbonsnake (*Thamnophis sauritus*) is usually found close to water as they are strong swimmers, often fleeing predators by diving into shallow water. It prefers wetland habitats where its prey species, frogs and small fish, are abundant. The Jackson Creek PSW provides suitable habitat; the smaller wetlands on the southern portion of the Site also provide marginal habitat. No Eastern Ribbonsnakes were observed during the field investigations.

The Monarch Butterfly (*Danaus plexippus*) uses a variety of habitats with wildflowers, including habitats such as Community 2, but requires milkweed plants as a food source for their caterpillars. Open areas of the Site provide suitable habitat (Communities 1, 2, and 3). No Monarch Butterflies were observed during the field investigations.

The Yellow-banded Bumble Bee (*Bombus terricola*) is a habitat generalist that can use a wide range of flowering plants. Open areas of the Site provide suitable habitat (Communities 1, 2, and 3). No Yellow-banded Bumble Bees were observed during the field investigations.

# 5.0 Wildland Fire Risk Assessment

The new Peterborough County Official Plan (adopted by Council in 2022), addresses Wildland Fire through Section 6.4.2 and the associated mapping in Appendix D, which provides a coarse scale assessment of areas with the greatest potential for high to extreme wildland fire risk. The Site is not mapped by the County in Appendix D of the new Official Plan.

As part of the present study, a preliminary wildfire risk assessment was carried out based on consideration of criteria outlined in the Wildland Fire Assessment and Mitigation Reference Manual in support of Provincial Policy Statement, 2014 (Ontario Ministry of Natural Resources and Forestry, 2017), and guidelines provided in the new Peterborough County Official Plan.

Most of the interior of the Site consisted of open pasture (Community 1; Figure 2) that experiences grazing pressure. This community was dominated by grasses. Soils were mineral, and leaf litter was relatively shallow, ranging from <2 cm deep to 5cm deep, with some areas of exposed soil. Similar conditions were observed in adjacent cultural meadow habitats (Communities 2 and 3).

Three areas of coniferous forest were identified along the northern boundary of the Site. The White Spruce plantation (Community 4) had abundant dead branches within 2 m of the ground surface, and the ground was covered with fine woody debris (<10 cm diameter). Soils were mineral but had a 2 cm deep horizon of organic coniferous leaf litter at the ground surface. Two areas of Eastern White Cedar coniferous forest (Community 5) also had abundant dead branches within 2 m of the ground surface. The ground was covered with fine woody debris, and several areas of downed trees (blowdown) were observed. Soils were mineral but had a layer of coniferous leaf littler at the soil surface (approx. 5 cm deep).

A willow thicket swamp (Community 6) in the northeast area of the Site was dominated by deciduous willow shrubs and was characterized by dense shrub and herbaceous cover. Dead woody debris was rare in this area. Soils were saturated but showed no signs of organic matter build up. Two small meadow marsh habitats (Community 7) were dominated by Cattails and

Reed Canarygrass, with some standing water; little to no organic matter build up was observed in these areas.

The PSW beyond the property boundary to the north consisted generally of shallow marsh dominated by cattails. This area contained standing water. Soils sampled along the shoreline indicate the presence of an organic horizon that extended to a depth of 10 cm. It is anticipated that the presence of standing water in the community is likely permanent, and that deeper accumulations of organic matter are likely present father from shore. Litter in this area consisted of spent cattails; no woody debris was observed.

Given the above results, the Jackson Creek PSW and adjacent patches of coniferous woodland (Communities 4 and 5) present greater fire risk at the Site. The open areas and willow thicket (Communities 1, 2, 3, 6 and 7) present lesser fire risk at the Site. White Spruce dominated forests are considered an extreme/high risk in general; Eastern White Cedar dominated forests and non-forested communities are not specifically ranked by the MNRF (Ontario Ministry of Natural Resources and Forestry, 2017).

# 6.0 Recommendations for Site Layout

The following recommendations for Site Layout are based on our assessment of natural heritage and hydrologic features on the Site and adjacent lands, as detailed in Section 4.0:

- Future site alteration and built features should be directed away from the Jackson Creek PSW along the northern Site boundary; a minimum 30 m setback should be applied to this feature, as shown on Figure 3. A 120 m setback from this feature is also shown, for context.
- Future site alteration and built features should be directed away from the watercourse and wetlands in the southern portion of the Site, to the extent possible; at a minimum, drainage function should be maintained. Note that a development permit may be required from ORCA.
- Tree removals should be limited to the extent possible; prior to any tree removals, a vegetation inventory and protection plan should be prepared, and a bat maternity roost survey should be carried out, in any areas where tree removals are proposed (see Section 7.0).

## 7.0 Recommended Additional Studies

To address information gaps identified through the current Study, and verify the currency of background information collected, Cambium recommends that additional studies be conducted as the project progresses. Additional natural heritage study should include a fieldwork program consisting of the activities summarized in Table 7, below.

**Table 7 Terrestrial and Aquatic Field Investigations**

| Activity | Details | Timing | Notes |
|---|---|---|---|
| Vascular Plant Survey and Community Classification | Two-season vegetation survey; Ecological Land Classification (ELC) System for Southern Ontario; Communities will be evaluated for their sensitivity, rarity, and botanical quality | May to June, July to October | Recommended generally for the Site |
| Headwater Drainage Feature Assessment | Three surveys; mapping and characterization of watercourses, waterbodies, springs/seeps, and other surface drainage features based on methods outlined in the Ontario Stream Assessment Protocol (OSAP) and the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC/TRCA, 2014). | March /April, April/May, and July/August | Recommended pending site alteration in proximity to the watercourse and wetlands on the southern portion of the Site |
| Amphibian Breeding Surveys | Three evening surveys for frogs and toads; Marsh Monitoring Program (MMP) protocol | April, May, and June | Recommended pending site alteration in proximity to the watercourse and wetlands on the southern portion of the Site |
| Wildlife Tree Survey | One survey during leaf-off period in any areas of proposed tree removals; MNRF protocols and updated (2022) guidance. | November to April | Recommended pending proposed tree removals |
| Breeding Bird Surveys | Two morning surveys; Ontario Breeding Bird Atlas protocol | May 24 to July 10 | Recommended generally for the Site |

| Activity | Details | Timing | Notes |
|---|---|---|---|
| Grassland Breeding Bird Surveys | Three morning surveys; MNRF protocol for Eastern Meadowlark, during overlapping survey period for Bobolink | May 21 to July 3 | Recommended generally for the Site |
| Turtle Visual Encounter Surveys | Five surveys; Visual Encounter Surveys, MNRF protocol for Blanding's Turtle | April to June 15 | Recommended generally for the Site |
| General Wildlife Habitat Surveys | Visual encounter surveys for evidence of breeding, foraging, sheltering, nesting, and/or movement | During all field investigations | Recommended generally for the Site |

The additional information collected should be compiled to characterize the existing form and function of natural heritage features on and adjacent to the Site and provide an evaluation of the significance and sensitivity of those features. Furthermore, an assessment of potential for impacts to these features in relation to the proposed undertaking should be provided, to guide the decision-making process and preparation of Site Plans.

# 8.0 Mitigation Measures and Best Management Practices

To minimize potential impact to the natural environment on and surrounding the Site, Cambium recommends that the mitigation measures and best management practices outlined in Table 8 be implemented prior to and during construction.

**Table 8 Mitigation Measures and Best Management Practice Recommendations**

| Potential Impact | Recommended Best Practice |
|---|---|
| Erosion and Sedimentation | A comprehensive Erosion and Sediment Control (ESC) Plan should be developed and implemented for the construction phase of the project. Given the topography of the Site, a treatment-train approach may be required to minimize sediment mobility.<br>Prior to any construction activities taking place, it is essential that perimeter sediment fencing be installed around construction areas. Fencing should be properly keyed into the ground and securely fastened to vertical supports spaced ≤ 2 m apart. This key control measure will help prevent sediment from entering surface water features (i.e., wetlands and the watercourse) in the surrounding landscape. All sediment fencing should be regularly maintained and kept in good working condition, until the area has been stabilized and/or successfully revegetated. Any observed overland drainage channels originating from Site, that may or may not have arisen as a result of erosion, should be directed to a check dam structure, prior to discharging to off-site areas.<br>Construction activities that require earthworks (e.g., grading, excavation, etc.) should be scheduled to avoid dates of heavy rainfall events and times of high runoff volumes. |
| Wildlife: Birds (Disturbance and Harm) | Nesting birds and their nests, eggs, and young are protected under the Migratory Birds Convention Act, 1994. Vegetation clearing on the Site should occur outside the breeding bird season, which extends from April 15 to August 15 in the local area (as per Environment and Climate Change Canada Guidelines). |
| Wildlife: Bats (Disturbance and Harm) | Tree removal should be limited to the building envelope to the extent possible. Small scale tree removal will not result in impairing or eliminating the function of habitat to support bat life processes provided the tree removal avoids the active bat season (April 1 – September 30). |
| Wildlife: Reptiles (Disturbance and Harm) | Sediment fencing can function as wildlife exclusion fencing. To exclude wildlife from the Site, sediment fencing should be installed around the entire perimeter of the construction area prior to the earlier |

| Potential Impact | Recommended Best Practice |
|---|---|
| | of May 1 or commencement of Site preparation to keep turtles and snakes from entering the construction area. This fencing should be made of heavy-duty sediment fence, staked at regular intervals, trenched-in at least 10-20 cm below ground, with an above ground height of at least 60 cm. The sediment fence should be inspected regularly to ensure that it remains in good condition: and any downed areas, rips, or holes should be repaired or replaced immediately. A designated point of ingress/egress should be identified, and a moveable barrier be constructed, to allow for the Site to fully remain enclosed while allowing vehicular access to the Site as needed.<br>The construction area should also be actively inspected for turtles and snakes each day prior to the start of work throughout the duration of construction.<br>As the Site is located adjacent to potential habitat for turtles, workers should be aware of the nesting season for turtles, which extends from May 15 to August 15. All stockpiled materials should be kept inside the exclusion fencing area and ideally should be covered and well secured around the base, to prevent turtles from nesting in loose substrates. Should any nesting turtles be encountered, work should stop immediately, and the turtle should be left to finish nesting undisturbed. The turtle should be photographed, and the nest marked to ensure it is not disturbed during construction, or until eggs have hatched (late August – September). If a nest is laid in a stockpile or other area that requires disturbance, Cambium should be contacted to determine if the nest can be relocated. |
| Species at Risk (SAR; Threatened and Endangered) | SAR observations, including most species of snakes and turtles, should be reported to the Natural Heritage Information Centre (NHIC).<br>If any individuals are encountered, they should be photographed and allowed time to move out of harm's way. SAR should not be handled by unauthorized individuals. |
| Species at Risk (SAR; Threatened Grassland Bird Species) | The open areas of the Site, where future site alteration is most likely to occur, have potential to support two threatened grassland bird species: Bobolink and Eastern Meadowlark. Under the ESA, the Ministry of the Environment, Conservation and Parks (MECP) has the authority to grant various types of permits and authorizations for activities that would otherwise not be allowed under the Act, with conditions that are aimed at protecting, reducing harm, and/or recovering SAR. Regulatory exemptions are available in relation to any land development activity within habitat of Bobolink and/or Eastern Meadowlark following Section 13 of O. Reg. 830/21, provided |

| Potential Impact | Recommended Best Practice |
|---|---|
| | the area of habitat to be damaged or destroyed by the activity is equal to or less than 30 ha, and either:<br>1. Proponent compensates for habitat loss on their land or rented land, or<br>2. Proponent pays into the provincial trust for compensation to occur elsewhere.<br>Provided the proponent adheres to the requirements of O. Reg. 830/21, and/or appropriate payment is made to the Species at Risk Conservation Trust, per O. Reg. 829/21, the proposed development would comply with the ESA. |
| Spread of Invasive Species | Invasive species are becoming problematic throughout Ontario and can adversely impact our natural landscapes, including wetlands, woodlands, and watercourses. Best management practices to reduce the spread of invasive species include:<br>1. Revegetate with species native to the local area.<br>2. Request fill and compost from reputable sources that are conscious of the potential for the spread of invasive species via these media.<br>3. Get to know the most common invasive species in the area.<br>4. Brush off or clean any shoes, boots and equipment that have encountered invasive species before returning to the property. Equipment and vehicles coming into the work area should be free of soil and seeds that could introduce non-native and invasive species following the Clean Equipment Protocol for Industry: Inspecting and Cleaning Equipment for the Purposes of Invasive Species Prevention (Halloran, 2013)<br>5. Immediately eradicate invasive species if they are observed on the property.<br>6. Do not compost invasive species; put them in plastic bags and dispose of them in the garbage.<br>7. Do not dispose of lawn or garden clippings in the forest or wetlands to avoid species introductions.<br>An excellent resource for identifying and controlling invasive species can be found through the Ontario Invasive Plant Council: Home - Ontario Invasive Plant Council (ontarioinvasiveplants.ca) (OIPC, 2022) |
| Anthropogenic Impacts – Noise | Noise is not expected to increase significantly because of the proposed development as it is consistent with the land use on the surrounding properties. Maintaining the wooded areas surrounding |

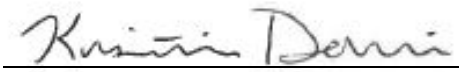
| Potential Impact | Recommended Best Practice |
|---|---|
| | the natural features on the Site will serve to buffer wildlife within the natural areas from noise-related impacts.<br>Temporary acute noise may occur during construction activities and should follow appropriate local noise by-laws. All equipment should be equipped with appropriate mufflers to mitigate noise levels during construction. |
| Anthropogenic Impacts – Lighting | Artificial lighting can have an impact on nocturnal movement of wildlife within natural areas. To minimize impacts to wildlife, it is recommended that outdoor lights be operated on timers, rather than by motion detection. Outdoor lighting associated with the development should be directed at the ground, rather than into the adjacent natural areas. Bulb wattage should be as low as practical while meeting the safety intent of the lighting. Lighting in common areas should be capped to direct light to the intended area of the ground to limit light pollution. |

## 9.0 Closing

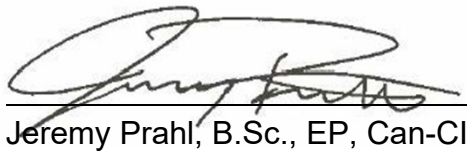
Cambium completed a preliminary Natural Heritage Constraints Study on the Lily Lake Solar Farm property on behalf of Peterborough Utilities Group, to support project planning for a proposed battery storage facility. Various natural heritage and hydrologic features were identified on and adjacent to the Site. Mitigation measures and additional studies have been recommended to support the preparation of Site Plans. The information presented herein demonstrates that based on available information, the proposed undertaking can be carried out in a way that will not adversely impact natural heritage and hydrologic features and functions on or adjacent to the subject Site. We welcome the opportunity to help further guide the planning process for this project as it relates to the protection and preservation of natural heritage.

Respectfully submitted,

**Cambium Inc.**



Kristina Domsic, B.E.S.
Ecologist / Project Coordinator



Jeremy Prahl, B.Sc., EP, Can-CISEC
Senior Ecologist / Natural Sciences Group Manager

*\\cambiumincstorage.file.core.windows.net\projects\18500 to 18599\18512-001 PUG Services Corp - ENV - Lily Lake Solar Farm Battery Storage\Deliverables\EIS\Final\2023-09-26 RPT- NH Constraints Study - Lily Lake Road Solar Farm.docx*

## 10.0 References

Bird Studies Canada. (2005). *Atlas of the Breeding Birds of Ontario.*

Conservation Ontario. (2022). *Conservation Ontario*. Retrieved from About Conservation Ontario: https://conservationontario.ca/about-us/conservation-ontario

Crins, W. J., Gray, P. A., Uhlig, P. W., & Wester, M. C. (2009). *The Ecoregions of Ontario, Part I: Ecozones and Ecoregions.* Peterborough, Ontario: Ministry of Natural Resources: Inventory, Monitoring and Assessment. Retrieved from https://dr6j45jk9xcmk.cloudfront.net/documents/2712/stdprod-101587.pdf

Fisheries and Oceans Canada. (2022). *Aquatic Species at Risk Map.* Retrieved from Fisheries and Oceans Canada: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Government of Ontario. (2007, August). *O.Reg 230/08: Species at Risk in Ontario List under Endangered Species Act, 2007, S.O. 2007, c.6.* Retrieved from e-Laws: https://www.ontario.ca/laws/regulation/080230

Government of Ontario. (2023). *Aquatic Resource Area Summary.* Retrieved from Land Information Ontario: https://www.ontario.ca/data/aquatic-resource-area-survey-point

Halloran, J. (2013). *Clean Equipment Protocol for Industry: Inspecting and Cleaning Equipment for the Purposes of Invasive Species Prevention.* Peterborough: Ontario Invasive Plant Council.

Lee, H., Bakowsky, W., Riley, J., Bowles, J., Puddister, M., uhlig, P., & McMurray, S. (1998). *Ecological Land Classification for Southern Ontario: First Approximation and Its Application.* Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guid FG-02: Ministry of Natural Resources.

Ministry of Municipal Affairs and Housing. (2020). *A Place to Grow: Growth Plan for the Greater Golden Horseshoe.* Queens Printer for Ontario.

Ministry of Municipal Affairs and Housing. (2020). Provincial Policy Statement. Ontario.

Ministry of Natural Resources. (2000). *Significant Wildlife Habitat Technical Guide. 151p.* Ontario : MNR.

Ministry of Natural Resources. (2010). *Natural Heritage Reference Manual from the Natural Heritage Policies of the Provincial Policy Statement, 2005 - Second Ed.*

Ministry of Natural Resources. (2022). *Ontario Wetland Evaluation System Southern Manual, 4th Ed.* Ontario.

Ministry of Natural Resources and Forestry. (2015). *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E.*

Ministry of Natural Resources and Forestry. (2022). *Fish ON-Line*. Retrieved from https://www.gisapplication.lrc.gov.on.ca/FishONLine/Index.html?locale=en-US&site=FishONLine&viewer=FishONLine

Ministry of Natural Resources and Forestry. (2023). Retrieved from Make a Map: Natural Heritage Areas: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US

Ministry of the Environment, Conservation and Parks. (2019). *Client's Guide to Preliminary Screening for Species at Risk.*

MNR. (2000). *Significant Wildlife Habitat Technical Guide. 151p.* Ministry of Natural Resources.

OIPC. (2022, August 2). *Ontario Invasive Plant Council*. Retrieved from Best Management Practices: https://www.ontarioinvasiveplants.ca/resources/best-management-practices/

Ontario Ministry of Natural Resources. (2019). *Peterborough District Wetland Report.* Peterborough.

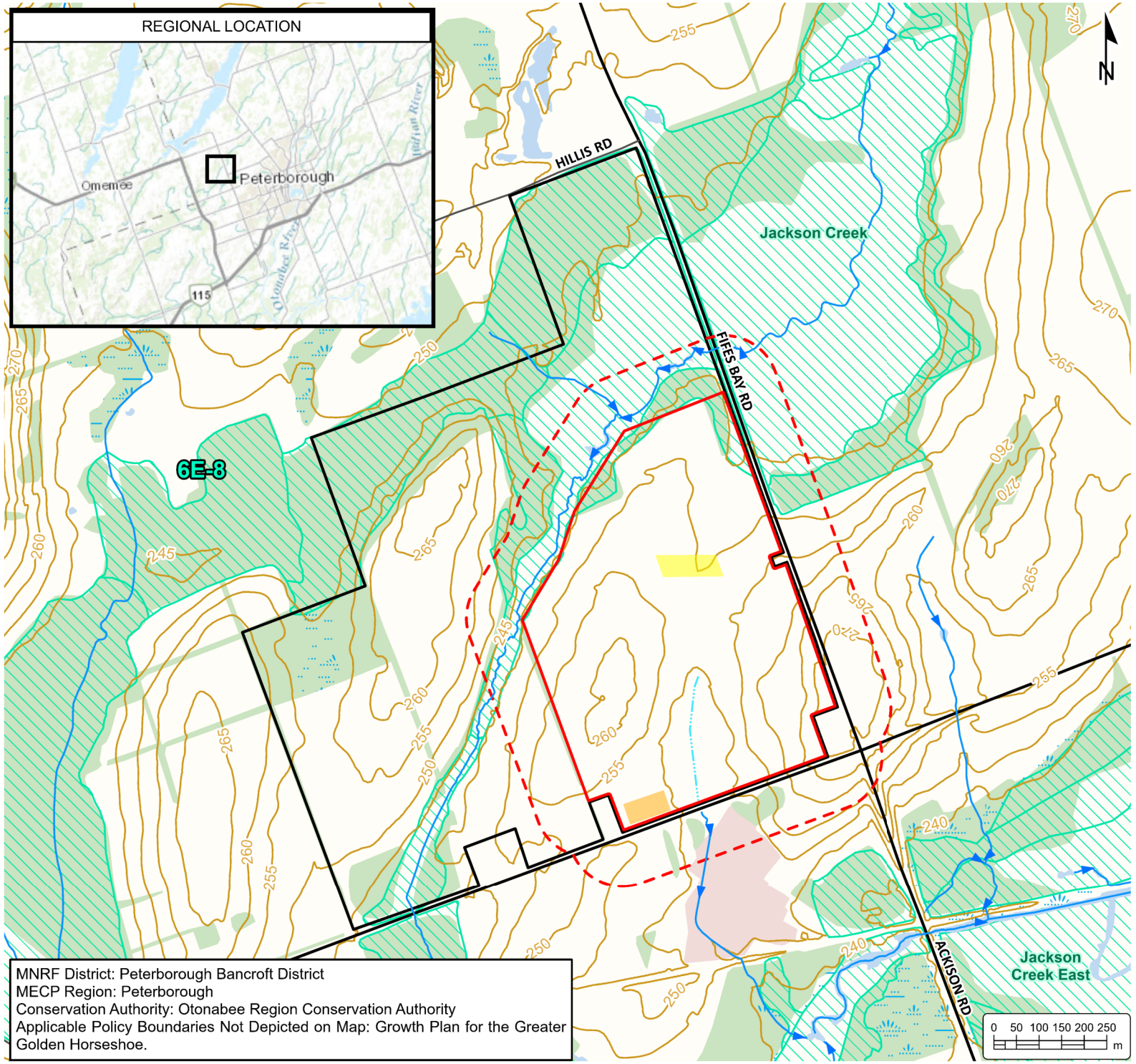
Ontario Ministry of Natural Resources and Forestry. (2017). *Wildland Fire Assessment and Mitigation Reference Manual in support of Provincial Policy Statement, 2014.* Toronto: Queens Printer for Ontario.

Ontario Nature. (2018). *Ontario Reptile and Amphibian Atlas.* Retrieved from Ontario Nature: https://ontarionature.org/oraa/maps/

# Appended Figures

# NATURAL HERITAGE CONSTRAINTS STUDY

PETERBOROUGH UTILITIES GROUP SERVICES CORP.
394 Lily Lake Road,
Selwyn, Ontario




## LEGEND

- Major Road
- Minor Road
- Contour 5m Interval
- Watercourse, Permanent
- Watercourse, Ephemeral
- Ecodistrict
- Provincially Significant Wetlands
- Wetland Unevaluated
- Water Area
- Wooded Area
- Built Up Area
- Site (approximate)
- Adjacent Lands (120m)
- Subject Property
- Proposed Battery Detail Area
- Proposed Substation Area

**Notes:**
-Site boundaries are approximate and are based on the County of Peterborough parcel fabric obtained through ArcGIS Map Service.
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

MNRF District: Peterborough Bancroft District
MECP Region: Peterborough
Conservation Authority: Otonabee Region Conservation Authority
Applicable Policy Boundaries Not Depicted on Map: Growth Plan for the Greater Golden Horseshoe.

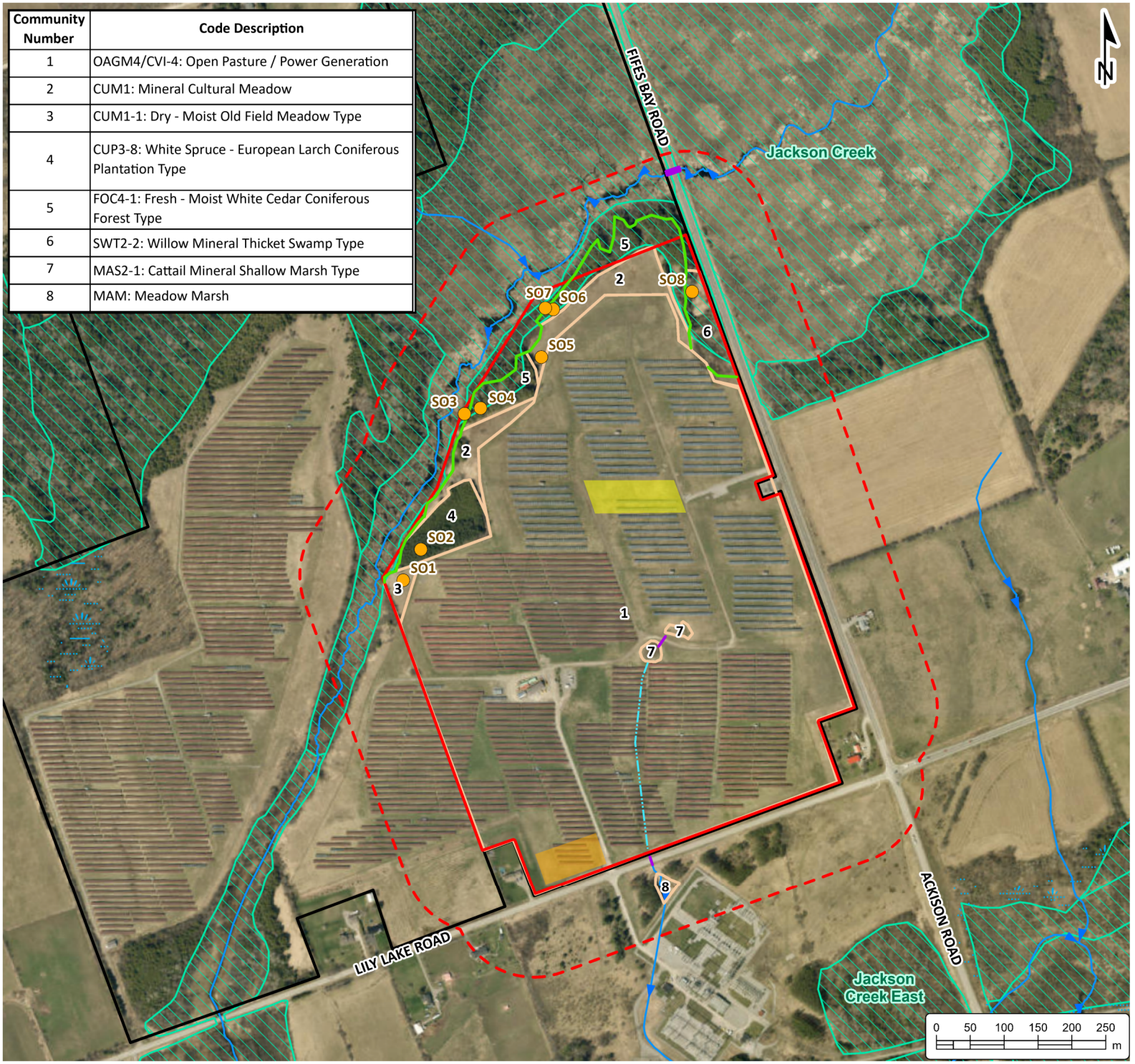

CAMBIUM
194 Sophia Street
Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
www.cambium-inc.com


## LANDSCAPE SETTING AND POLICY AREAS

| | | | |
|---|---|---|---|
| Project No.: 18512-001 | | Date: September 2023<br>Rev.: | |
| Scale: 1:12,000 | | Projection: NAD 1983 UTM Zone 17N | |
| Created by: NLB | Checked by: KD | Figure: | 1 |

O:\GIS\MXDs\18500-18599\18512-001 PUG Services Corp - ENV - Lily Lake Solar Farm Battery Storage\2023-09-11 NHC 18512.aprx

| Community Number | Code Description |
|---|---|
| 1 | OAGM4/CVI-4: Open Pasture / Power Generation |
| 2 | CUM1: Mineral Cultural Meadow |
| 3 | CUM1-1: Dry - Moist Old Field Meadow Type |
| 4 | CUP3-8: White Spruce - European Larch Coniferous Plantation Type |
| 5 | FOC4-1: Fresh - Moist White Cedar Coniferous Forest Type |
| 6 | SWT2-2: Willow Mineral Thicket Swamp Type |
| 7 | MAS2-1: Cattail Mineral Shallow Marsh Type |
| 8 | MAM: Meadow Marsh |




# NATURAL HERITAGE CONSTRAINTS STUDY

PETERBOROUGH UTILITIES GROUP SERVICES CORP.
394 Lily Lake Road,
Selwyn, Ontario

## LEGEND

- Soil Assessment Station
- Watercourse, Permanent
- Watercourse, Ephemeral
- Culvert
- Verified Wetland Boundary
- Vegetation Communities
- Site (approximate)
- Adjacent Lands (120m)
- Subject Property
- Provincially Significant Wetlands
- Wetland Unevaluated
- Proposed Battery Detail Area
- Proposed Substation Area

**Notes:**
-Site boundaries are approximate and are based on the County of Peterborough parcel fabric obtained through ArcGIS Map Service.
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.


CAMBIUM
194 Sophia Street
Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
www.cambium-inc.com


## NATURAL HERITAGE FEATURES AND ECOLOGICAL SURVEY STATIONS

| | | | |
|---|---|---|---|
| Project No.: 18512-001 | | Date: September 2023 Rev.: | |
| Scale: 1:8,000 | | Projection: NAD 1983 UTM Zone 17N | |
| Created by: NLB | Checked by: KD | Figure: | 2 |

O:\GIS\MXDs\18500-18599\18512-001 PUG Services Corp - ENV - Lily Lake Solar Farm Battery Storage\2023-09-11 NHC 18512.aprx


# NATURAL HERITAGE CONSTRAINTS STUDY

PETERBOROUGH UTILITIES GROUP SERVICES CORP.
394 Lily Lake Road,
Selwyn, Ontario

## LEGEND

- Watercourse, Permanent
- Watercourse, Ephemeral
- Culvert
- Verified Wetland Boundary
- Wetland Setback (30m)
- Wetland Setback 120m
- Site (approximate)
- Adjacent Lands (120m)
- Subject Property
- Provincially Significant Wetlands
- Wetland Unevaluated
- Proposed Battery Detail Area
- Proposed Substation Area

**Notes:**
-Site boundaries are approximate and are based on the County of Peterborough parcel fabric obtained through ArcGIS Map Service.
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

CAMBIUM
194 Sophia Street
Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
www.cambium-inc.com

## NATURAL HERITAGE CONSTRAINTS

| | | | |
|---|---|---|---|
| Project No.: 18512-001 | | Date: September 2023<br>Rev.: | |
| Scale: 1:7,000 | | Projection: NAD 1983 UTM Zone 17N | |
| Created by: NLB | Checked by: KD | Figure: | 3 |

C:\GIS\MXDs\18500-18599\18512-001 PUG Services Corp - ENV - Lily Lake Solar Farm Battery Storage\2023-09-11 NHC 18512.aprx

# Appendix A

# Species of Conservation Concern Screening

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal SARA | Provincial SARO | Provincial S-RANK | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| **Birds** | | | | | | | | |
| Bald Eagle | *Haliaeetus leucocephalus* | No Status | SC | S2N,S4B | The Bald Eagle is a bird of prey with a white head, neck and tail, a massive bright yellow beak, powerful legs, and a wingspan of over 2 m. It nests in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. These nests are usually on islands in freshwater lakes or in large trees such as the pine and poplar. During the winter, they may also be found near open bodies of water that do not freeze (1). | No | Known to occur in the general area | No further consideration required |
| Bank Swallow | *Riparia riparia* | THR | THR | S4B | The Bank Swallow is a small songbird of around 12 cm long with a distinctive dark breast band, that flies with quick and erratic wingbeats (1). It nests in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. This can include banks of rivers and lakes, bluffs, active sand and gravel pits, road cuts and stockpiles of soils. However, they prefer sand-silt substrates for excavating their nest burrows. They often use large wetlands as communal nocturnal roosts post-breeding or during wintering periods (2). | No | Known to occur in the general area | No further consideration required |
| Barn Swallow | *Hirundo rustica* | THR | SC | S4B | The Barn Swallow is a mid-sized songbird with steel-blue backs and wings, glossy in males, and a line of white spots across its upper tail. It lives in a variety of open habitats for foraging, such as grassy fields, pastures, certain agricultural crops, shorelines, cottage areas, wetlands, or subarctic tundra (2). They prefer to nest within human made structures such as barns, bridges, and culverts. Barn Swallow nests are cup-shaped and made of mud, typically attached to horizontal beams or vertical walls underneath an overhang (1). | No | Known to occur in the general area | No further consideration required |
| Black Tern | *Chlidonias niger* | No Status | SC | S3B | The Black Tern is a small waterbird with a forked tail, straight pointed bill, slender shape, and black head during breeding season. It builds floating nests in loose colonies in shallow marshes, with a preference for cattails. They breed primarily in the marshes along the edges of the Great Lakes, but may also use wetlands further north if suitable (1). | Yes: adjacent lands only | Known to occur in the general area | Potential significant wildlife habitat on-site |
| Bobolink | *Dolichonyx oryzivorus* | THR | THR | S4B | The Bobolink is a mid-sized songbird of tan colour with black stripes, except for males during summer breeding season who are black with a white back and yellow collar. It prefers tall, grassy meadows, hayfields and some croplands, and feeds (largely on insects) on the ground in dense grasses (1). It tends to nest in forage crops: hayfields and pastures dominated by species including clover, bluegrass, and broadleaf plants (2). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |
| Canada Warbler | *Cardellina canadensis* | THR | SC | S4B | The Canada Warbler is a small songbird with bright yellow underparts and bluish-grey back and tail (1). It can be found in a variety of forest types, but is most abundant in moist, mixed forests with a well-developed, dense shrub layer. Nests are usually located on or near the ground on mossy logs, and along stream banks (3). | No | Known to occur in the general area | No further consideration required |
| Cerulean Warbler | *Setophaga cerulea* | END | THR | S3B | The Cerulean Warbler, a small songbird, is blue-green with white eyebrows and two prominent white wing bars (1). It requires relatively large tracts of mature deciduous forest (>100 ha), and nests in older, second-growth deciduous forests. During breeding season, it is found in relatively large tracts of mature deciduous forests that feature large, tall trees and an open understorey (4). | No | Known to occur in the general area | No further consideration required |
| Chimney Swift | *Chaetura pelagica* | THR | THR | S4B,S4N | The Chimney Swift is a small bird, between 12 and 14 cm, with a brown, cigar-shaped body, slender wings, and an erratic flight pattern. Prior to settlement, the Chimney Swift would mainly nest in cave walls and hollow trees. Now, it is found mostly near urban and suburban areas where the presence of chimneys or other manmade structures provide nesting and roosting habitat. They also tend to stay in habitat close to the water (1). | No | Known to occur in the general area | No further consideration required |

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal SARA | Provincial SARO | Provincial S-RANK | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| Common Nighthawk | *Chordeiles minor* | THR | SC | S4B | The Common Nighthawk is a medium-sized bird with long, pointed wings, a long tail with a notch, and and large eyes. Its plumage of dark brown with black and white specks blends with its roost site. It is typically found in open areas such as gravel beaches, rock outcrops and burned woodlands, that have little to no ground vegetation. This species can also be found in highly disturbed locations such as clear cuts, mine tailing areas, cultivated fields, urban parks, gravel roads, and orchards (1). | No | Known to occur in the general area | No further consideration required |
| Eastern Meadowlark | *Sturnella magna* | THR | THR | S4B | The Eastern Meadowlark is a medium-sized migratory songbird with a bright yellow throat and belly, a black V shape on its chest, and a pointed bill. It prefers pastures and hayfields, but is also found to breed in orchards, shrubby fields, human-use areas such as airports and roadsides, or other open areas. The Eastern Meadowlark can nest from early May to mid-August, in nests that are built on the ground and well-camouflaged with a roof woven from grasses (1). | Yes: on-site and adjacent lands | Incidental observation on-site | Potential habitat for endangered or threatened species on-site |
| Eastern Whip-poor-will | *Antrostomus vociferus* | THR | THR | S4B | The Eastern Whip-poor-will is a medium-sized bird with mottled brown and grey feathers to blend in with its surroundings, a large flattened head, and small bill. They are usually found in areas with a mix of open and forested areas such as patchy forests with clearings, forests that are regenerating after major disturbances, savannahs, open woodlands or openings in more mature forests. Breeding habitat is dependent on forest structure rather than composition, although common tree associations are pine and oak, and it nests directly on the forest floor (2). The species prefers to nest in semi-open or patchy forests with clearings as it forages in open areas and uses forested areas for roosting (1). | No | Known to occur in the general area | No further consideration required |
| Eastern Wood-Pewee | *Contopus virens* | SC | SC | S4B | The Eastern Wood-pewee is a species of 'flycatcher', a bird that eats flying insects. It grows to approximately 15 cm, has greyish-olive upper parts and pale bars on its wings. This species lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation (1). It typically creates nests on tree branches 2-12 m in height (2). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential significant wildlife habitat on-site |
| Evening Grosbeak | *Coccothraustes vespertinus* | SC | SC | S4B | The Evening Grosbeak is a large songbird with a thick greenish bill. It is a social bird that is often found in flocks, particularly during the winter months. Their preferred habitat is thick coniferous forest. During their breeding season, they are generally found in open, mature mixed forests dominated by Firs, White Spruce, or Trembling Aspen (1). | No | Known to occur in the general area | No further consideration required |
| Golden Winged Warbler | *Vermivora chrysoptera* | THR | SC | S4B | The Golden-winged Warbler is a small songbird with distinctive yellow wing patches and patches behind their eyes. It inhabits early successional habitat of old fields and favour areas where trees are spread out or forest edges to use for perching, singing, and searching for food. They seem to prefer regeneration zones with young shrub growth, surrounded by mature forest, locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas for their breeding sites; often frequenting clusters of herbaceous plants and low bushes (1). | No | Known to occur in the general area | No further consideration required |
| Grasshopper Sparrow | *Ammodramus savannarum* | SC | SC | S4B | The Grasshopper Sparrow is a small songbird with a streaked back, a white stripe down the center of its crown, a flattish head, and a conical beak. It inhabits open grasslands and prairies with well-drained soil, preferring areas that are sparsely vegetated. It will also nest in hayfields and pastures, as well as alvars and occasionally grain crops such as barley (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential significant wildlife habitat on-site |

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal | Provincial | | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| | | SARA | SARO | S-RANK | | | | |
| Least Bittern | *Ixobrychus exilis* | THR | THR | S4B | The Least Bittern is a small member of the heron family, reaching around 30 cm in length. It has brown and beige plumage with chestnut patches on its wings (1). The species nests in marshes (> 5 - 10 ha) and swamps dominated by emergent vegetation, preferably cattails, interspersed with patches of woody vegetation and open water. They require dense vegetation and open water with stable levels within 10 m for nesting, and access to clear, open water for foraging (4). | Yes: adjacent lands only | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |
| Loggerhead Shrike | *Lanius ludovicianus* | END | END | S2B | The Loggerhead Shrike is a small bird with a black, hooked bill, grey crown, and white throat and chest. This species has specific habitat requirements that are dependent on active livestock grazing, or grassland areas that have naturally short grass cover (i.e. alvar communities). They also require spiny, multi-branched shrubs, or barbed fencing, to catch prey. They prefer grassland habitats that have sporadic occurrences of low trees and shrubs; particularly hawthorn species, which are used as part of their feeding behaviour (1). | No | Known to occur in the general area | No further consideration required |
| Olive-sided Flycatcher | *Contopus cooperi* | THR | SC | S4B | The Olive-sided Flycatcher is a medium-sized songbird with olive colouring, often seen perching on top of tall trees waiting to catch their prey. It prefers open areas along natural mature forest edges, forest edges near natural openings such as rivers or swamps, human-made openings, or burned forest openings with numbers of dead trees. Breeding habitat usually consists of coniferous or mixed forests adjacent to rivers or wetlands, in Ontario often nesting in White and Black Spruce, Jack Pine, and Balsam Fir (1). | No | Known to occur in the general area | No further consideration required |
| Red-headed Woodpecker | *Melanerpes erythrocephalus* | END | END | S4B | The Red-headed Woodpecker is a mid-sized bird, at around 20 cm long, with a vivid red head, neck and breast as well a strong bill. The species can be found in open woodland and woodland edges, often near man-made landscapes such as parks, golf courses and cemeteries. These areas must contain a large number of dead trees for perching and nesting (1). | No | Known to occur in the general area | No further consideration required |
| Short-eared owl | *Asio flammeus* | SC | SC | S2N,S4B | The Short-eared Owl has a large round head with small tufts of feathers, long wings, a short tail, and cryptic colouring of brown streaks. This species is found in scattered pockets across the province where suitable open habitat, including grasslands, tundra, peat bogs and marsh, can be found in sufficient quantities. Adults build nests on the ground in grassy areas and occasionally agriultural fields (1). The main factor influencing their choice in habitat is believed to be an abundance of their food source, primarily rodents and other small mammals (2). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential significant wildlife habitat on-site |
| Wood Thrush | *Hylocichla mustelina* | THR | SC | S4B | The Wood Thrush is a medium-sized songbird of around 20 cm with rusty brown coloured upper parts and white underparts with large dark spots. It breeds in deciduous and mixed forests with moderate understories, shade and abundant leaf litter where it forages for food, including larval and adult insects as well as plant material. They prefer moist stands of trees with well-developed undergrowth and tall trees for perches (1). | No | Known to occur in the general area | No further consideration required |
| **Fish** | | | | | | | | |
| American Eel | *Anguilla rostrata* | No Status | END | S1? | The American Eel is a long, slender bodied fish, with one long fin extending down the back and around the tail, and two small pectoral fins. It has thick lips, and a protruding lower jaw that extends out above the upper jaw. At the juvenile stage, they swim up the St. Lawrence River to reach Lake Ontario and connected tributaries where they will remain for 8 to 23 years before migrating back to their spawning grounds. In Ontario, the American eel prefers mud, sand or gravel substrates during the juvenile stage when they reside primarily in the benthic zone of waterbodies. More mature eels are able to thrive in most environments provided there is available cover during daylight hours, and the habitat is accessible (2). | No | Known to occur in the general area | No further consideration required |

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal SARA | Provincial SARO | Provincial S-RANK | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| Lake Sturgeon | *Acipenser fulvescens* | No status | END | S2 | The Lake Sturgeon, a large freshwater fish, has an extended snout with four whisker-like organs hanging near the mouth and is dark to light brown or grey on its back and sides with a lighter belly. In Ontario, this fish is found in the rivers of the Hudson Bay Basin, the Great Lakes basin, and their connecting waterways. Lake Sturgeon's live almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel and are usually found at depths of 5 to 20 m. They spawn in relatively shallow, fast-flowing water or if available deeper water habitat as well (1). | No | Known to occur in the general area | No further consideration required |
| Northern Sunfish (Great Lakes - Upper St. Lawrence population) | *Lepomis peltastes* | SC | SC | S3 | The Northern Sunfish is a small (about 130 mm long), typical looking member of the sunfish family (Centrarchidae). It has a deep, laterally compressed and olive coloured body with bright blue and red markings. In Ontario, the Northern Sunfish lives in shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds, with sandy banks or rocky bottoms. Northern Sunfish prefer to be near aquatic vegetation where they can avoid strong currents. The Great Lakes - Upper St. Lawrence Populations are found throughout southern Ontario including waters flowing into Lake Huron, Georgian Bay, Lake St. Clair, Lake Erie and Lake Ontario, as well as rivers and small lakes in eastern Ontario (1). | No | Known to occur in the general area | No further consideration required |
| **Herptiles** | | | | | | | | |
| Blanding's Turtle | *Emydoidea blandingii* | END | THR | S3 | Blanding's Turtles are identifiable by their bright yellow throat and chin and domed shell. They spend the majority of their life cycle in the aquatic environment, usually in large wetlands or shallow lakes with high densities of water plants (1). These turtles prefer shallow, nutrient rich water with organic sediment and dense vegetation. They use terrestrial sites for travel between habitat patches and to lay clutches of eggs, often going hundreds of meters from their nearest water body. Blanding's Turtles nest in dry coniferous and mixed forest habitats, as well as fields and roadsides (2). From late October until the end of April, they hibernate in the mud at the bottom of permanent water bodies (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |
| Eastern Musk Turtle | *Sternotherus odoratus* | SC | SC | S3 | The Eastern Musk Turtle is small with a narrow carapace, a dark brown body and two light stripes on each side of their head (5). It is a small freshwater turtle found primarily in slow moving water bodies with abundant emergent vegetation and mucky bottoms along the southern edge of the Canadian Shield within which they burrow into overwinter. Nesting sites vary, but must be close to the water and exposed to direct sunlight (1). | Yes: adjacent lands only | Known to occur in the general area | Potential significant wildlife habitat on adjacent lands |
| Midland Painted Turtle | *Chrysemys picta marginata* | SC | - | S4 | The Midland Painted Turtle has a olive to black carapace with red or dark orange markings on the marginal scutes, as well as red and yellow stripes on the head and neck. The species uses a variety of waterbodies including, ponds, marshes, lakes and slow-moving creeks with a soft bottom and an abundance of basking sites and aquatic vegetation. This species usually hibernates on the bottom of waterbodies (5). | Yes: adjacent lands only | Known to occur in the general area | No further consideration required |
| Northern Map Turtle | *Graptemys geographica* | SC | SC | S3 | The Northern Map Turtle is a medium sized turtle identified by its carapace's map contour-like patterning. It lives in larger lakes and rivers, requiring high water quality to support their primary prey species: molluscs. This species can often be seen in large groups basking together on rocks and logs. In the winter, the Northern Map Turtle can be found hibernating on the bottom of slow-moving rivers (1). | No | Known to occur in the general area | No further consideration required |

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal SARA | Provincial SARO | Provincial S-RANK | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| Snapping Turtle | *Chelydra serpentina* | SC | SC | S3 | The Snapping Turtle, with its large serrated carapace, small plastron, and spiked tail, is Canada's largest freshwater turtle (5). It spends the majority of its life in water, preferring shallow water with soft mud and leaf litter, and will travel upland to gravel or sandy embankments, roadsides, along railway lines or beaches to lay their eggs (1). | Yes: adjacent lands only | Known to occur in the general area | Potential significant wildlife habitat on adjacent lands |
| Spotted Turtle | *Clemmys guttata* | END | END | S2 | The Spotted Turtle is named after the distinct yellow spots on its carapace. The species is semi-aquatic and prefers ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation. This species usually hibernates in wetlands or seasonally wet areas with structures such as overhanging banks, hummocks, tree roots, or aquatic animal burrows (1). | Yes: adjacent lands only | Known to occur in the general area | Consideration required under the ESA |
| Eastern Hog-nosed Snake | *Heterodon platirhinos* | THR | THR | S3 | The Eastern Hog-nosed Snake can be a variety of colours and patterns so is most easily identified by its flattened, upturned nose. They prefer sandy well-drained habitats such as beaches and dry forests because they lay their eggs, hibernate and burrow in these areas. The main diet of this snake is toads and frogs, so they usually stay close to water including marshes and swamps, where they have an increased chance of finding their preferred prey (1). | No | Known to occur in the general area | No further consideration required |
| Eastern Milksnake | *Lampropeltis triangulum* | SC | NAR | S4 | The Eastern Milksnake's colouration is grey or tan with reddish alternating blotches otlines in black along its back and sides (5). It has recently been delisted from being a species at risk in Ontario (1). This species tends to use open habitats such as rocky outcrops, fields and forest edges. The preferred prey of milksnakes are mice, small rodents, and ground nesting birds which are amply found in and surrounding agricultural outbuildings. The milksnake is secretive and is not likely to be encountered during the day or at night while hunting (5). | Yes: on-site and adjacent lands | Known to occur in the general area | No further consideration required |
| Eastern Ribbonsnake | *Thamnophis sauritus* | SC | SC | S4 | The Eastern Ribbonsnake is slender with three bright yellow stripes running down its back and sides and a white crescent in front of each eye. This snake is usually found close to water as they are strong swimmers, often fleeing predators by diving into shallow water. It prefers wetland habitats where its prey species, frogs and small fish, are abundant. Over winter, they congregate in underground burrows or rock crevices to hibernate (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential significant wildlife habitat on-site |
| Common Five-lined Skink (Southern Shield Population) | *Plestiodon fasciatus* | SC | SC | S3 | The Common Five-lined Skink is Ontario's only lizard species. Its Southern Shield population can be found underneath rocks on open bedrock in forests and like to bask on sunny rocks and logs. They hibernate in crevices among rocks or buried in the soil (1). They hibernate in groups under rocks and tree stumps or in rotting wood (5). | No | Known to occur in the general area | No further consideration required |
| Western Chorus Frog | *Pseudacris triseriata* | THR | - | S3 | The Western Chorus Frog is small with a dark stripe running through its eye and a light stripe underneath (5). It is primarily a lowland terrestrial species that requires access to terrestrial and aquatic habitats in close proximity to one another. Relying on marshes and wooded wetlands adjacent to forested habitats, this species also requires isolated, predator free pools for breeding. Temporary pools, such as vernal pools in wooded areas, are preferred. This species hibernates terrestrially in a variety of environments, including leaf litter, wood debris, and vacant animal burrows (2). | Yes: on-site and adjacent lands | Known to occur in the general area | No further consideration required |
| **Invertebrates** | | | | | | | | |
| Monarch Butterfly | *Danaus plexippus* | SC | SC | S2N,S4B | The Monarch is an orange and black butterfly with small white spots and a wingspan of around 10 cm. It relies on milkweed plants as a food source for growing caterpillars, but the adult butterflies forage in diverse habitats for nectar from wildflowers (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential significant wildlife habitat on-site |

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal SARA | Provincial SARO | Provincial S-RANK | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| Mottled Duskywing | *Erynnis martialis* | No Status | END | S2 | The Mottled Duskywing is a medium-sized butterfly in the skipper family with a wingspan of 25-42 mm. It is dark grey with yellow-brown spots on its hind wings that give the species its mottled appearance and its name. The wings of freshly emerged adults have a purplish iridescence that fades with age. The mottled duskywing tends to live in dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars. In Ontario, the mottled duskywing will only deposit their eggs on two closely-related plants: New Jersey tea and prairie redroot (1). | No | Known to occur in the general area | No further consideration required |
| West Virginia White | *Pieris virginiensis* | No Status | SC | S3 | The West Virginia White is a small, dingy white butterfly. This species is found in moist deciduous woods, and requires a supply of toothwort, a small, spring-blooming plant, which provides the only source of food for its larvae. The West Virginia White is found mostly in the central and southern parts of Ontario, but its range extends north to Manitoulin and St. Joseph islands (1). | No | Known to occur in the general area | No further consideration required |
| Yellow-banded Bumble Bee | *Bombus terricola* | SC | SC | S3S5 | The Yellow-banded Bumble Bee is a medium-sized bumble bee with a distinct yellow and black abdominal band pattern found on its queens, males, and workers. This species is a forage and habitat generalist, able to use a variety of nectaring plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands and urban areas. The Yellow-banded Bumble Bee ranges from the Mixedwood Plains of southern Ontario to the Hudson Bay Lowlands in the north (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential significant wildlife habitat on-site |
| **Mammals** | | | | | | | | |
| Tri-colored Bat | *Perimyotis subflavus* | END | END | S3? | The Tri-colored Bat is small, with pale brown with orange-red forearms, muzzle, and ears. It is named for the black, yellow, and brown hairs on its back. It is considered rare in this region of Ontario which is at the northernmost limit of the natural range. These bats prefer to nest in foliage, tree cavities and woodpecker holes, but are occasionally found in buildings; though this is not their preferred habitat. Winter hibernation takes place in caves, mines and deep crevices. Tri-colored Bats prefer an open forest habitat type in proximity to water (6). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |
| Eastern Small-footed Myotis | *Myotis leibii* | No Status | END | S2S3 | The Eastern Small-footed Myotis has fur with black roots and shiny brown tips as well as very small feet. In the spring and summer, the Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. They change their roosting locations daily and hunt at night for insects. They hibernate in winter, often in caves and abandoned mines choosing colder and drier sites than other similar bats (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |
| Little Brown Myotis | *Myotis lucifugus* | END | END | S4 | The Little Brown Myotis has glossy brown fur and a fleshy projection covering the entrance to its ears. This species roosts in trees and buildings, often selecting attics, abandoned buildings and barns for summer colonies where they can raise their young. Little Brown Bats hibernate from October/November to March/April, most often in caves or abandoned mines that are humid and remain above freezing (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |
| Northern Myotis | *Myotis septentrionalis* | END | END | S3 | The Northern Myotis has dull yellow-brown fur with pale bellies and long, rounded ears. This species is found in boreal forests, roosting under loose bark and in the cavities of trees. These bats hibernate from October/November to March/April, most often in caves or abandoned mines (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Potential habitat for endangered or threatened species on-site |

**APPENDIX: Species of Conservation Concern - County of Peterborough**

| COMMON NAME | SCIENTIFIC NAME | Federal SARA | Provincial SARO | Provincial S-RANK | SPECIES DESCRIPTION AND HABITAT REQUIREMENTS | SUITABLE HABITAT | SPECIES OBSERVATIONS | ASSESSMENT |
|---|---|---|---|---|---|---|---|---|
| Algonquin Wolf | *Canis lycaon* | SC | THR | S4 | Formerly called the Eastern Wolf, this canine was recently renamed the Algonquin Wolf. In the southern portion of the province, this species prefers deciduous and mixed forest landscapes while their northern range include mixed and coniferous forests. It is most prevalent in areas with abundant prey species which include Beaver, White-tailed Deer and Moose. Dens sites are usually found in coniferous forests with easily excavated soil types like sand and close to a permanent water source (1). | No | Known to occur in the general area | No further consideration required |
| **Trees, plants, fungi and lichens** | | | | | | | | |
| American Ginseng | *Panax quinquefolius* | END | END | S2 | American Ginseng is a perennial plant which grows up to 60 centimetres in height. The leaves typically have five leaflets arranged in a whorl at the end of the leaf stem. The root looks like a gnarly parsnip. The flowers are an inconspicuous green-white in colour, but the berries are bright red and arranged in a cluster. In Ontario, the American Ginseng typically grows in rich, moist, and mature deciduous woods dominated by Sugar Maple, White Ash, and American Basswood. It typically grows in deep, nutrient rich soil over limestone or marble bedrock (1). | No | Confirmed absent through targeted surveys | No further consideration required |
| Black Ash | *Fraxinus nigra* | No status | END | S4 | The Black Ash is a smaller-sized tree with a narrow crown, light grey and scaly bark, and green, oval leaflets on a central stalk. It grows everywhere in Ontario except for the far north, preferring moist climates and soils such as swampy woodlands or bogs (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Consideration required under the ESA |
| Butternut | *Juglans cinerea* | END | END | S2? | The Butternut is a medium sized tree reaching 30 m in height. It has large compound leaves with 11 to 17 leaflets. The fruit is oval, fuzzy and sticky. In Ontario, the Butternut prefers moist, well-drained soil, often along streams, or occasionally well-drained gravel sites. It grows alone or in small groups in deciduous forests (1). | Yes: on-site and adjacent lands | Known to occur in the general area | Consideration required under the ESA |
| Pale-bellied Frost Lichen | *Physconia subpallida* | END | END | S3 | The Pale-bellied Frost Lichen resembles a light dusting of frost on a dark tree trunk. This species is found throughout eastern North America, growing in wooded areas rich in hardwood species, such as White Ash, Hop Hornbeam (Ironwood), Black Walnut, and American Elm. It is also common to find this species growing on fenceposts or boulders within or near these wooded areas. In Ontario, this species has been found in the following counties: Frontenac, Haliburton, Hastings, Peterborough, Lanark and Renfrew (1). | No | Confirmed absent through targeted surveys | No further consideration required |

**References**

1. Ministry of Environment, Conservation and Parks. (2022). Species at Risk in Ontario. Retrieved from https://www.ontario.ca/page/species-risk-ontario
2. Government of Canada. (2021). Species at Risk Public Registry. Retrieved from https://species-registry.canada.ca/index-en.html#/species?ranges=5&sortBy=commonNameSort&sortDirection=asc&pageSize=10
3. Committee on the Status of Endangered Wildlife in Canada. (2008).
4. Environment Canada. (2018).
5. Ontario Nature. (2020). Reptiles and Amphibians. Retrieved from https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/species/
6. University of Michigan Museum of Zoology. (2004).

# Appendix B
# Photographic Log

***Photo 1 Looking east across low topography area / small wetland / headwaters of mapped watercourse on the Site, September 2023.***

***Photo 2 Culvert under access laneway conveying ephemeral drainage between wetland pockets at headwaters of mapped watercourse on the Site, September 2023.***

***Photo 3 Looking east across grassed swale / mapped watercourse in south-central area of the Site, September 2023.***

***Photo 4 Looking south/downstream through culvert under Lily Lake Road, September 2023.***

***Photo 5 Looking south/downstream of Lily Lake Road; no visible flow path along mapped watercourse, September 2023.***

***Photo 6 Looking East toward the PSW and watercourse from Fife's Bay Road, September 2023.***

***Photo 7 Looking north from the Site into the PSW, August 2023.***

***Photo 8 Vegetation Community 1: OAGM4 – Open Pasture / CVI_4 Power Generation, August 2023.***

***Photo 9 Vegetation Community 2: CUM1-1 - Dry – Moist Old Field Meadow, August 2023.***

***Photo 10 Vegetation Community 4: CUP3-8 - White Spruce – European Larch Coniferous Plantation Type, August 2023.***

***Photo 11 Vegetation Community 5: FOC4-1` - Fresh – Moist White Cedar Coniferous Forest Type, August 2023.***

***Photo 12 Vegetation Community 6: SWT2-2 - Willow Mineral Thicket Swamp Type, August 2023.***

***Photo 13 Vegetation Community 7: MAS2-1 - Cattail Mineral Shallow Marsh Type, August 2023.***

***Photo 14 Vegetation Community 8: MAM - Meadow Marsh, September 2023.***

# Appendix C

# Significant Wildlife Habitat Screening

| SWH Type | Associated Species | Associated ELC Ecosites | Habitat Criteria | Potential (Y/N) | Notes |
|---|---|---|---|---|---|
| **Seasonal Concentration Areas of Animals** | | | | | |
| Waterfowl Stopover and Staging Areas (Terrestrial) | Ducks | Cultural Ecosites: CUM1, CUT1 | Fields that flood during spring (mid-March to May). | Y | Suitable habitat in the PSW |
| Waterfowl Stopover and Staging Area (Aquatic) | Ducks, Geese | Marshes, Swamps, Shallow Water Ecosites: MAS1,MAS2, MAS3, SAS1 SAM1, SAF1, SWD1 to SWD7, | Ponds, marshes, lakes, bays, coastal inlets, and watercourses. Sewage treatment ponds and storm water ponds **not** SWH Reservoir managed as a large wetland or pond/lake qualifies. | Y | Suitable habitat in the PSW |
| Shorebird Migratory Stopover Area | Shorebirds | Beaches, Dunes, Meadow Marshes: BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1 to MAM5 | Shorelines of lakes, rivers and wetlands. Sewage treatment ponds and storm water ponds **not** SWH. | Y | Suitable habitat in the PSW |
| Raptor Wintering Area | Eagles, Hawks, Owls | Hawks/Owls - Combination of Forest and Cultural Ecosites: FOD, FOM, FOC, CUM, CUT, CUS, CUW<br><br>Bald Eagle: Forest or swamp close to open water (hunting ground): FOD, FOM, FOC, SWD, SWM, SWC | Raptor wintering sites: >20ha, with a combination of forest and upland. Idle/Fallow/Meadow (>15ha) with adjacent woodlands.<br>Eagle sites: open water, large trees and snags for roosting. | N | No suitable habitat on Site |
| Bat Hibernacula | Big Brown Bat, Tri-coloured Bat | Caves, Crevices: CCR1, CCR2, CCA1, CCA2 | Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Buildings and active mine sites **not** SWH. | N | No suitable habitat on Site |
| Bat Maternity Colonies | Big Brown Bat, Silver-haired Bat | Deciduous or mixed forests and swamps: FOD, FOM, SWD, SWM | Mature deciduous and mixed forest stands with >10/ha; large trees >25 cm DBH with cavities. | N | No suitable habitat on Site |
| Turtle Wintering Area | Turtles | SW, MA, OA, SA, FEO, BOO | Free water beneath ice. Soft mud substrate. Permanent water bodies, large wetlands, bogs, fens with adequate DO. | Y | Suitable habitat in the PSW |
| Reptile Hibernaculum | Snakes | Habitat may be found in any ecosite other than very wet ones.<br>Five-lined Skink: FOD and FOM, FOC1, FOC3 | Below frost line in burrows, rock crevices, rock piles or slopes, stone fences, abandoned stone foundations. Conifer or shrub swamps/swales, poor fens, depressions in bedrock with accumulations of sphagnum moss or sedge hummock ground cover. Skink: mixed forest with rock outcrop openings; granite bedrock with fissures. | Y | Suitable habitat in transitional slopes along the PSW edge |
| Colonially-nesting Bird Breeding Habitat (Bank and Cliff) | Cliff Swallow, Northern Rough-winged Swallow | Eroding banks, sandy hills/piles, burrow pits, steep slopes, cliff faces, bridge abutments, silos, barns. CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1 | Exposed soil banks, **not** a licensed/permitted aggregate area. Does **not** include man-made structures (bridges or buildings), or recently (2 yrs) disturbed soil areas (berms, embankments, soil/aggregate stockpiles). | N | No suitable habitat on Site |

| SWH Type | Associated Species | Associated ELC Ecosites | Habitat Criteria | Potential (Y/N) | Notes |
|---|---|---|---|---|---|
| Colonially-nesting Bird Breeding Habitat (Tree/Shrubs) | Great Blue Heron, Black-crowned Night Heron, Great Egret, Green Heron | SWM2, SWM3, SWM5, SWM6, SWD1 to SWD7, FET1 | Nests in live or dead standing trees in wetlands, lakes, islands and peninsulas. Shrubs and emergents may be used. Nests in trees are 11 to 15 m from ground, near top of the tree. | Y | Suitable habitat in the PSW |
| Colonially-nesting Bird Breeding Habitat (Ground) | Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull, Common Tern, Caspian Tern, Brewer's Blackbird | Rocky island or peninsula in lake or river. Close to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird). MAM1 – 6; MAS1 – 3; CUM, CUT, CUS | Gulls and terns nesting on islands or peninsulas with open water or marshy areas. Brewers Blackbird colonies are found on the ground in low bushes close to streams and irrigation ditches within farmlands. | N | No suitable habitat on Site |
| Migratory Butterfly Stopover Area | Painted Lady, Red Admiral, **Special Concern:** Monarch | Combination of open and forested ecosites (need one from each). Field: CUM, CUT, CUS Forest: FOC, FOD, FOM, CUP | Minimum of 10 ha, located within 5 km of Lake Ontario. Combination of field and forest, undisturbed sites, with flowering species (preferred nectar plants). | N | No suitable habitat on Site |
| Landbird Migratory Stopover Areas | All migratory songbirds. All migrant raptor species. | FOC, FOM, FOD, SWC, SWM, SWD | Woodlots need to be >10 ha in size and within 5 km of Lake Ontario. If multiple woodlands are located along the shoreline, those Woodlands <2km from Lake Ontario are more significant. Include a variety of habitats; forest, grassland and wetlands. | N | No suitable habitat on Site |
| Deer Yarding Areas | White-tailed Deer | FOM, FOC, SWM, SWC, CUP2, CUP3, FOD3, CUT | Stratum I: core deer yard - coniferous forest; 60% canopy cover with pine, hemlock, cedar, spruce. Stratum II: mixed or deciduous forest with plenty of browse available, may include agricultural areas. | N | No suitable habitat on Site |
| Deer Wintering Congregation Areas | White-tailed Deer | FOC, FOM, FOD, SWC, SWM, SWD | When movement is not constrained by snow depth (20cm) Woodlots > 100 ha and used annually. | N | No suitable habitat on Site |
| **Rare Vegetation Communities** | | | | | |
| Cliffs and Talus Slopes | | TAO, TAS, CLO, CLS, TAT, CLT | Cliff: near vertical bedrock >3m in height; Talus Slope: coarse rock rubble at the base of a cliff | N | No suitable habitat on Site |
| Sand Barren | | SBO1, SBS1, SBT1 | Sand Barrens >0.5 ha. Vegetation can vary from patchy and barren to continuous meadow, thicket--like, or tree covered (less than 60%). Less than 50% vegetation cover are exotic species. | N | No suitable habitat on Site |
| Alvar | *Indicator species: Carex crawei, Panicum philadelphicum, Eleocharis compressa, Scutellaria parvula, Trichostema brachiatum,* Loggerhead Shrike | ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 | Alvar >0.5 ha. Level, mostly unfractured calcareous bedrock with mosaic or rock pavements and bedrock overlain with thin veneer of soil. Vegetation cover varies from patchy to barren with <60% tree cover. | N | No suitable habitat on Site |
| Old Growth Forest | | FOD, FOC, FOM, SWD, SWC, SWM | Woodland areas 30 ha or greater or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest. | N | No suitable habitat on Site |
| Savannah | | TPS1, TPS2, TPW1, TPW2, CUS2 | No minimum size; A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60% with less than 50% cover of exotic species. Remnant sites (railway right-of-ways) are **not** SWH. | N | No suitable habitat on Site |

| SWH Type | Associated Species | Associated ELC Ecosites | Habitat Criteria | Potential (Y/N) | Notes |
|---|---|---|---|---|---|
| Tallgrass Prairie | | TPO1, TPO2 | No minimum size; An open Tallgrass Prairie habitat has < 25% tree cover. Less than 50% cover of exotic species. Remnant sites (railway right-of-ways) are not SWH. | N | No suitable habitat on Site |
| Other Rare Vegetation Communities | | Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. | Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. Review Appendix M | N | No suitable habitat on Site |
| **Specialized Habitat for Wildlife** | | | | | |
| Waterfowl Nesting Area | Ducks | Upland habitats adjacent to: MAS1 to MAS3, SAS1, SAM1, SAF1, MAM1 to MAM6, SWT1, SWT2, SWD1 to SWD4 | Extends 120 m from a wetland or wetland complex. Upland areas should be at least 120 m wide. Wood Ducks and Hooded Mergansers use cavity trees (>40cm dbh) in woodlands. | Y | Suitable habitat in the PSW |
| Bald Eagle and Osprey Nesting, Foraging and Perching Habitat | Osprey, Bald Eagle | FOD, FOM, FOC, SWD, SWM, SWC directly adjacent to riparian areas | Nesting areas are associated with waterbodies along forested shorelines, islands, or on structures over water. | Y | Suitable habitat in transitional slopes along the PSW edge |
| Woodland Raptor Nesting Habitat | Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk | All forested ELC ecosites. Forests, swamps, and conifer plantations: FOD, FOM, FOC, SWD, SWM, SWC, CUP3 | Natural or conifer plantation woodland/forest stands >30 ha with > 10 ha interior habitat. Stick nests. | N | No suitable habitat on Site |
| Turtle Nesting Areas | Midland Painted Turtle, Snapping Turtle, Northern Map Turtle | Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within: MAS1 to MAS3, SAS1, SAM1, SAF1, BOO1 | Nest sites close to water, within open sunny areas with soil suitable for digging. Sand and gravel beaches. Nesting areas on sides of roads are not SWH. | Y | Suitable habitat in open areas of the Site |
| Seeps and Springs | Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp. | Seeps/Springs are areas where ground water comes to the surface. | Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream/river system. | Y | Suitable habitat in transitional slopes along the PSW edge |
| Amphibian Breeding Habitat (Woodland) | Woodland Frogs and Salamanders | FOC, FOM, FOD, SWC, SWM, SWD | Wetland, pond or woodland pool of >500 $m^2$ within or adjacent (within 120m) to wooded areas (no min. size). Woodlands with permanent ponds or those containing water until mid-July are preferred. | N | No suitable habitat on Site |
| Amphibian Breeding Habitat (Wetlands) | Toads, Frogs, and Salamanders | SW, MA, FE, BO, OA and SA.<br><br>Typically isolated (>120m) from woodland ecosites, however larger wetlands may be adjacent to woodlands. | Wetlands >500$m^2$ isolated from woodland ecosites with high species diversity. Permanent water bodies with abundant vegetation for bullfrogs. | Y | Suitable habitat in the PSW |

| SWH Type | Associated Species | Associated ELC Ecosites | Habitat Criteria | Potential (Y/N) | Notes |
|---|---|---|---|---|---|
| Woodland Area-Sensitive Bird Breeding Habitat | Birds: Yellow-bellied Sapsucker Red-breasted Nuthatch, Veery, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren, Special Concern: Cerulean Warbler Canada Warbler | FOC, FOM, FOD, SWC, SWM, SWD | Large mature (>60 years) forest stands or woodlots > 30 ha. Interior forest habitat of >200 m from forest edge. | N | No suitable habitat on Site |
| **Habitat of Species of Conservation Concern** | | | | | |
| Marsh Bird Breeding Habitat | American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan | MAM1 to MAM6, SAS1, SAM1, SAF1, FEO1, BOO1 For Green Heron: SW, MA and CUM1 sites. | Wetlands with shallow water and emergent aquatic vegetation. | Y | No suitable habitat on site |
| Open Country Bird Breeding Habitat | Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow, Short-eared Owl | CUM1, CUM2 | Grassland/meadow >30 ha. Not being actively used for farming. Habitat established for 5 years or more. | Y | Suitable habitat in open areas of the Site |
| Shrub/Early Successional Bird Breeding Habitat | Brown Thrasher, Clay-coloured Sparrow, Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher, Yellow-breasted Chat, Golden-winged Warbler | CUT1, CUT2, CUS1, CUS2, CUW1, CUW2 | Large field areas succeeding to shrub and thicket habitats > 10 ha. Areas not actively used for farming in the last 5 years. | N | No suitable habitat on Site |
| Terrestrial Crayfish | Chimney or Digger Crayfish; (*Fallicambarus fodiens* ) Devil Crayfish or Meadow Crayfish; (*Cambarus Diogenes* ) | MAM1 to MAM6, MAS1 to MAS3, SWD, SWT, SWM, CUM1 sites with inclusions of the aforementioned. | Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish | Y | Suitable habitat in transitional slopes along the PSW edge |
| Special Concern and Rare Wildlife Species | Any species of concern or rare wildlife species (S1-S3, SH) plant and animal. | Any ELC code. | Presence of species of concern or rare wildlife species identified within 1 or 10 km grid (NHIC). | Y | None observed during field visits; see SCC Screening Table for more details |